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The *Journal* publishes only original, empirical research as articles or research notes. Manuscripts are considered with the understanding that their contents have not been published and are not under consideration elsewhere. In its articles, the *Journal* seeks to publish reports of research that develops, tests, or advances management theory and practice. All types of empirical methods—quantitative, qualitative, or combinations—are acceptable. The *Journal* does not publish purely conceptual or review articles; these are published in the *Academy of Management Review*. Atheoretical exploratory or survey research, methodological studies, replications or extensions of past research, and commentaries with new empirical content are also of interest for publication as research notes if they make an important contribution to knowledge relevant to management.

Articles and research notes should be written so they are understandable and interesting to all members of the Academy. The contribution of research in all specialized areas to general management theory and practice should be made evident. Specialized argot and jargon should be translated into terminology in general use within the fields of management.

Articles should also be written as concisely as possible without sacrificing meaningfulness or clarity of presentation. To save space, tables should be combined and data should be presented in the text wherever possible. Manuscripts submitted for publication as articles should not ordinarily exceed 30 double-spaced typewritten pages, including tables. Manuscripts submitted for publication as research notes should not exceed ten double-spaced typewritten pages including tables. Everything, including tables, in submitted manuscripts should be typed in double-spaced format on one side of the page. Manuscripts prepared on computers should be printed on letter-quality printers or, if other printers are used, in double-strike or enhanced print.

Decisions regarding publication of submitted manuscripts are based upon the recommendations of members of the Editorial Review Board and other qualified reviewers. All articles and research notes published in the *Journal* are subjected to the same anonymous review process. Reviewers evaluate manuscripts on their significance to the field, their conceptual adequacy, their technical adequacy, their appropriateness, and their presentation. Reviewers' comments are made available to authors.

Submissions should be sent to the editor, Dr. Janice M. Beyer, School of Management, Jacobs Management Center, State University of New York, Buffalo, New York 14260. Manuscripts should be prepared in accordance with the *AMJ Style Guide for Authors*, which is published periodically and is also available from the editor. Contributors should submit four copies of papers, retaining the original for their files. The *Journal* does not return manuscripts unless requested to do so.

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FROM THE EDITOR

I suspect all editors of scientific journals harbor visions of improving the journals they edit. These visions help to lure them into accepting the tremendous responsibilities involved, which inevitably require some sacrifice of their own research and other activities. After they assume the role, these visions probably help to sustain their motivation to keep up with the onerous number of detailed duties necessary to get each issue to press. Let me confess at the outset that I have been guilty of such visions. But let me also reassure *AMJ* readers that I do not plan any radical changes in editorial policy to achieve them. As is evident from the appearance of this issue, there have been changes, and there will be more. However, I see and intend these as incremental changes that will make a fine journal even better.

My primary aim is probably the same as that of all past editors of this and other journals: to publish the best research that is submitted. My second aim is to assist authors to present their research in a way that makes it accessible, interesting, and scientifically useful to the entire membership of the Academy and other management scholars, both now and in the future. A third aim is to encourage authors to consider and discuss the usefulness of their research to the practice of management. To further all of these aims, we will make every effort to provide authors with well-informed, balanced, careful, and constructive reviews. I believe that we can move toward realizing these aims without sacrificing the present strengths of *AMJ*, including prompt reviews and the maintenance of rigorous scientific standards.

All of my predecessors and their visions have had a hand in improving *AMJ* to the point where it is recognized today as a top journal in many of the subfields of management. On behalf of *AMJ* readers and on my own behalf, I want to thank them and the many members of past Editorial Boards for this fine legacy. Special thanks are due to my immediate predecessor, Tom Mahoney, who carried on the *AMJ* tradition under the pressure of an ever larger and ever wider diversity of submissions. During his editorship the quality of articles published continued to rise, the content of *AMJ* was broadened to include new perspectives and topics, and the circulation grew at a healthy rate. His uncompromising pursuit of the highest scientific standards and attention to the details that contribute to meeting those standards have been exemplary. Well done, Tom, and best wishes for your new endeavors.

As is customary, my first major concern as editor-elect was appointing a new Editorial Board. Those chosen include both relatively young scholars and well-established ones, most of them newcomers, with a few continuing stalwarts from past Boards. The newcomers bring fresh insights, enthusiasm, and expertise; keep us abreast of new developments and areas of research; help to ensure that *AMJ* doesn't get stuck in a narrow rut; and relieve those who have already served *AMJ* so well over the past few years. The continu-

ing stalwarts provide the experienced perspective and advice needed to deal with the diversity of articles submitted. Most of them began their duties by reviewing new submissions submitted after July 15, 1984. I added a few more members since then and plan to add others from time to time. New members will be chosen on the basis of their performance as ad hoc reviewers, as demonstrated by both the quality and timeliness of their reviews, and on the basis of need for certain kinds of expertise. I personally want to thank all who have already served as ad hoc reviewers at my request during the period from July 15 through December 31, 1984; we couldn't have managed without their help. A formal acknowledgement and list of their names appears elsewhere in this issue.

Because of the increasing numbers and diversity in submissions to *AMJ*, recent editors and some members of the Board of Governors suggested to me that I should consider a reorganization of the Editorial Board. To gain the experience needed to make an informed decision, I waited until this past fall—after I had handled the review process for new submissions for several months—to choose a plan. I decided a small number of Consulting Editors could both help me with the ever-increasing workload and help to ensure sound reviews in specialized areas. My first invitation went to Rick Mowday, who kindly accepted and assumed the role in October. At present, he and I are working out how best to interface our roles, especially how to route and process manuscripts so as to minimally delay getting decisions to authors. I plan to name one or two additional Consulting Editors with other kinds of expertise. Not all manuscripts will go to Consulting Editors; the number of submissions is too numerous to make that practical. Instead, I will use their advice as I feel the need for it. Each of them will be assigned specific manuscripts on which I want advice; after the regular reviews are received, they will make written recommendations to me based on the reviewers' recommendations and comments and on their own judgment. When disagreement occurs—either among the judgments of reviewers, or between the Consulting Editor and myself—the Consulting Editor involved and I will discuss the manuscript with the aim of reaching consensus. I will then make final decisions and write decision letters to authors.

To facilitate my aim of improving the accessibility, interest, and scientific usefulness of research published in *AMJ*, requirements and guidelines for format and style of submissions have been changed. The first and foremost of these new guidelines is an emphasis on authors' presenting their research so that scholars outside their specialized area can understand their ideas and data. This might involve, for example, providing a theoretical rationale linking the reported research to the theory and practice of management, or defining terms not in general use so that readers from other subfields can follow arguments and procedures, or perhaps citing sources of data that are taken for granted within a subfield.

To further the aims of improving accessibility and scientific usefulness, authors will be asked for more uniform and extensive reporting of research procedures and methods than has been customary in the past. Information

on the following should be included in the Methods section of future submissions:

1. Population - General information on the kinds of organizations, subunits, individuals, or other entities that are involved in the research so that readers can put the findings in a broader context than the variables measured provide—for example, size of organizations or subunits, their industry, type of ownership, whether they are unionized, type of products or services they produce, their dominant technology, their region of country; also, demographic data on respondents or subjects (age, gender, education, tenure, job status), types of jobs they perform, etc.
2. Sampling - The basis for selection of respondents or subjects from the population; size and description of population from which each sample was drawn; documentary sources used to identify the sampling frame of organizations, respondents, or subjects; refusal or nonresponse rates; data comparing non-respondents to respondents, if available.
3. Researcher-subject contact - The relationship of the researchers to the organizations, respondents, or subjects studied (instructor, paid consultant, unpaid researcher); length of relationship and extensiveness of contact between researchers and subjects; how researchers gained access to subjects, including type of sponsorship within the organizations studied.
4. Data collection - Exactly how data were collected, including who collected it, when, and what subjects were told about the study and their participation in it.
5. Measurement - Full information should be provided on all measures used, including all items and response formats for all scales (unless very familiar), reliability coefficients, and data available on validity. Also, methods like factor analysis or scaling techniques used as a basis for scale construction should be specified, and their results given. Similar detail should be provided for archival and qualitative measurements.
6. Statistical or other methods of analysis - The techniques employed to analyze data should be reported and explained in sufficient detail so that readers can follow exactly what was done.
7. Basic statistics - Both for the information of current readers and for future meta-analyses, the means, standard deviations, reliabilities, and intercorrelations of all quantitative measures should be reported whenever possible.

To accommodate this additional information, *AMJ* now permits appendices. Their use is especially appropriate for details of measurement in studies with many measures, or for presenting complex and lengthy formulas. Footnotes are also permitted, but should be used sparingly; they are appropriate for relevant methodological or other details that would otherwise interrupt the flow of an argument.

Minor changes have also been made in the format for citations and references; they are largely incorporated in this issue. A new Style Guide is

printed in the back of this issue and is available by request from the *AMJ* office.

To realize my third arm, we will encourage researchers to discuss their research findings in terms of their implications for practice. Even partial realization of this aim is likely to aid members in teaching future managers; it should also serve to make *AMJ* more useful and interesting to those members of the Academy who are practitioners. Just as important, thinking about the implications of our research for practice may deepen our understanding of our theory and results, and thus help to spur improvements in future research.

Finally, I have been aware of criticisms by some members of the Academy that *AMJ* is dull, uninteresting, and hard to read. Since I believe that improvements are always possible, I will try to deal with these criticisms by considering interest to readers in my decision of what to publish, and by helping authors to enhance the interest and liveliness of their articles. We are working hard to assist authors in presenting their ideas and data as effectively as possible. In particular, we are copy-editing manuscripts more heavily than has been customary in the past, with the assistance of a new copy editor—Seph Weene of Interlaken, New York. Authors have an opportunity to review our copy editing before their articles are sent to the typesetter, and then check the typeset version in galley.

With this issue, *AMJ* also has a new look. The new cover was designed by Sandra Starrett of Darby Press to give *AMJ* a fresh appearance without losing its identity as an Academy of Management publication. With the assistance of Rosemary Caldwell of Graphic Arts in Buffalo, a new format and typeface were chosen to improve both appearance and readability. Barbara Miner, our Production Editor, and Ray Eubanks of Repro Services, brought the new format to fruition. We all hope that *AMJ* readers like the new look.

J.M.B.

THE EFFECTS OF NEGOTIATOR PREFERENCES, SITUATIONAL POWER, AND NEGOTIATOR PERSONALITY ON OUTCOMES OF BUSINESS NEGOTIATIONS

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A laboratory experiment was used to investigate the joint effects of preferences, personality, and situational power on the outcomes of business negotiations. Results show that preferences vary across negotiators and directly determine outcomes; the effects of personality and power are significant but are mediated by preferences.

The exercise of influence in organizations is a basic process in management, insofar as management involves accomplishing objectives with and through others. A number of studies have been conducted concerning influence processes (e.g., Blackburn, 1981; Drake & Mitchell, 1977; Greene & Podsakoff, 1981; McFillen, 1978; Mowday, 1979; Nord, 1978; Ouchi, 1978; Schein, 1977; Spekman, 1979). Few of these, however, have adequately recognized that influence in organizations tends to be a bilateral process (Cobb, 1980; Fairhurst & Snavely, 1983; Herold, 1977; Mechanic, 1962; Salancik & Pfeffer, 1977). Negotiation is the process by which bilateral influence is articulated (Bacharach & Lawler, 1981; Dansereau, Graen, & Haga, 1975; Kipnis & Schmidt, 1983); despite its status as a fundamental organizational process, negotiation has received very little research attention in the literature on management and organizations.

A great deal of potentially relevant research has been conducted during the past two decades, mostly by experimental social psychologists (see e.g., Bacharach & Lawler, 1981; Rubin & Brown, 1975). Despite the fact that the research has been cumulative and generally of high quality, it has shortcomings. The three most serious deficiencies are the lack of integrative research, the tendency to oversimplify negotiation simulations, and the assumption that the subjects can assume and realistically experience the roles simulated in the experiment.

Integrative research is lacking because the effects of preferences, situational power, and personality on outcomes have been studied separately, with little research on the relationships among these factors and on their joint effects on negotiated outcomes. For instance, negotiators' personalities

have been recognized as having important effects on negotiations, but for the most part only one or two traits have been studied at a time. Rubin and Brown (1975) pointed out that broader personality predispositions rather than isolated traits affect real-life negotiations. They advocated more comprehensive measurement of personality, but it is not evident from the literature that many have taken up the challenge. Furthermore, personality is believed to relate to other important aspects of the bargaining relationship — such as situational power as perceived by the parties and the utility structure of the negotiators — but these phenomena have yet to be adequately investigated.

The tendency to oversimplify the simulated bargaining situation reduces external validity. First, most simulations involve only one attribute (Allen, Lambert, & Baird, 1983), whereas in the real world the typical negotiation decision requires multiattribute tradeoffs — for example, price versus quality. Second, and perhaps more seriously, an overwhelming proportion of bargaining research has used the prisoner's dilemma simulation as the context of research. Domination by this paradigm has fostered cumulative research by standardizing the context of negotiator behaviors, but at some cost to external validity. The essential elements of the situation are an inadequate sample of the elements that are important in negotiation situations in the real world. Another adverse consequence of oversimplifying the simulation is that outcomes are affected by denying subjects information that they would have in real life on the context of the negotiations (Crumbaugh & Evans, 1967; Evans & Crumbaugh, 1966; Orwant & Orwant, 1970).

It is important to question the assumption that subjects can realistically experience the simulated role, because experimental validity hinges on this assumption (Streufert & Suefeld, 1977). For example, the prisoner's dilemma presents most subjects — undergraduates, usually with no prison experience — with a situation that must be so foreign to their experience that actual cognitive manipulation accomplished in the experiment is likely to vary widely across subjects, depending on what experiences they bring to bear. In the case of business negotiations, the use of subjects who have little or no experience in bargaining can itself affect outcomes. Neale and Bazerman (1983), for instance, have demonstrated that experience affects negotiators' ability to achieve compromise settlements. Thus, a design criterion for experimental research should be whether subjects are placed in a role with which they can empathize.

Realistically assuming a role also implies assuming the preference structure of individuals whose role is being simulated. Although preference structures are somewhat idiosyncratic in the real world and must also be somewhat idiosyncratic in the laboratory, research is conducted as if the oversimplified role instructions lead subjects to form uniform preferences for the issues being negotiated. In fact it has been demonstrated that preference structures vary significantly across subjects in contextually-rich simulations (Greenhalgh & Neslin, 1981; Neslin & Greenhalgh, 1983) and that variations in preference structure are associated with variations in outcomes (Druckman, 1977).

Because of these problems with dominant social psychology paradigms, some critics (e.g., Zartman, 1977) have argued that many experimental simulations simply do not capture the essence of real-world negotiations. Our intention, however, is not to make a general indictment of laboratory research, even though our reservations add to the criticisms that have already been advanced (e.g., Allport, 1968; Gergen, 1969; Harre & Secord, 1972; Schlenker & Bonoma, 1978; Schultz, 1969; Wachtel, 1980; also the rejoinder by Berkowitz and Donnerstein, 1982). Rather, our intention is to point out that many of the limitations of research on bargaining result from the ideology of experimental social psychology, which favors rigorous control over external validity. A more balanced tradeoff seems to hold greater promise for fostering the growth of knowledge about interpersonal bargaining (Greenhalgh & Neslin, 1983).

In response to the limitations of existing research, this study explicitly investigates the effects of negotiators' preference structures, situational power, and personality on outcomes of bargaining. Data were generated with the use of a contextually-rich simulation of an actual business situation from subjects who were experienced and trained in business and who therefore could relate to the highly realistic situation in which they negotiated a contract.

Situational power was manipulated according to the principles of classical experimental design. Individual differences were assessed by measuring a broad range of personality characteristics with a variety of techniques, including assessment by a clinical psychologist, standardized self-rating measures, projective tests, personal and family histories, and peer ratings. Finally, this study explicitly measured rather than assumed the preference structures formed by role-taking subjects. As a result the study accommodates as a research variable the diversity in preferences that occurs when an experimenter attempts to induce subjects to adopt the preference structures of specified roles; in most studies this diversity is part of the error variance.

The present research is thus distinctive in that (1) it strives to integrate the effects of several variables rather than study them separately and (2) it accomplishes this with a research approach that balances both internal and external validity.

THE MODEL AND ITS COMPONENTS

Preferences

By definition, any bargaining exchange involves one or more issues concerning the manner in which resources are to be allocated among the parties (Rubin & Brown, 1975). An obvious determinant of negotiated outcomes is the utility to the negotiators of the various resources at stake. Variability in utilities across negotiators taking the same role can be expected because the immediate preference structure guiding behavior in a negotiation reflects both the negotiator's unique underlying preference structure and a communicated preference structure. In real life the communicated preference structure is the mandate set by the negotiator's constituency

(Druckman, 1977; Hermann & Kogan, 1968; Klimoski, 1978; Walton & McKersie, 1965); in the laboratory the constituency's mandate is contained in the role instructions established by the researcher. The underlying and communicated preference structures combine to create idiosyncratic negotiator preference structures, which researchers need to measure.

Social psychologists have recognized the importance of negotiator utilities. For instance, it is acknowledged that both tangible issues (e.g., money) and intangible issues (e.g., face-saving) may be at stake in a negotiation. Translated into experimental research terms, the task is to examine the effect of increasing incentive magnitude; this effect is usually investigated simplistically by varying the stakes of a prisoner's dilemma game (Rubin & Brown, 1975: 137–139). The more interesting and more important question for real-life negotiations is how negotiators assess tradeoffs among various bargaining issues or attributes (the individual resources at stake). For instance, if one negotiator preferred a high dollar, low face-saving outcome and the opponent preferred the opposite, the negotiation would proceed quite differently from a negotiation in which the attributes were similarly ranked.

A few studies have considered multiattribute negotiations (Druckman, 1977; Froman & Cohen, 1970; Greenhalgh & Neslin, 1981; Kelley, 1966; Neale & Bazerman, 1983). Druckman's work pointed out that preferences can be idiosyncratic despite uniform role-playing instructions and that therefore more powerful analyses can be conducted if negotiator preferences are measured rather than assumed. Greenhalgh and Neslin showed that conjoint analysis (Green & Rao, 1971) provides reliable and valid measures of negotiators' multiattribute preferences.

Conjoint analysis is particularly advantageous in negotiation research because it permits operationalization of the two essential elements of a negotiator's preference structure — namely, preference for individual bargaining issues and preference for no settlement. The conjoint analysis technique simulates negotiated choices in real-world interactions by measuring preferences for individual bargaining issues in the context of overall outcome packages. During bargaining, negotiators propose and evaluate sets of issues, such as price, quantity, delivery terms, and guarantees that constitute possible outcome packages. The data used in conjoint analysis are gathered by asking negotiators to rank-order a sample of possible outcome packages. Interval-scaled utilities reflecting each negotiator's idiosyncratic preferences can then be calculated for each component issue and therefore for each possible outcome package.

Preference for the no-settlement outcome must also be measured in order to identify each negotiator's resistance point, the point within the hierarchy of possible outcome packages at which the negotiator is indifferent about accepting the deal or reaching an impasse. The resistance point is not the point at which the utility of the outcome packages has fallen to zero, as one might at first suspect. Rather, it is the point at which the negotiator can achieve equal utility from dealing with another party.

Situational Power

Power is a logical determinant of negotiation outcomes. Common to most definitions of social power is the notion of getting the other to do something he or she would not do in the absence of influence. In the case of negotiation, power takes the form of inducing the other to settle for an outcome of less than his or her maximum utility. This result can be achieved through tactical skill or situational power. Tactical skill involves the ability to persuade (broadly defined) and is considered below as an individual-difference variable.

Situational power concerns the control of resources. When power is viewed as the obverse of dependence (Bacharach & Lawler, 1981; Emerson, 1962), one negotiator has favorable situational power when the other has a greater need to arrive at a settlement. This condition prevails when the reward structure is biased in favor of one negotiator, when one negotiator can deny the other his or her outcomes, and when one negotiator has better alternatives and is therefore more willing to walk away from the negotiation without a settlement. Differential situational power has been manipulated in the laboratory in a variety of ways, with the observed result that the more powerful party usually used that power (Rubin & Brown, 1975) and as a result had a higher outcome than the weaker party.

Personality

Individual differences in negotiators can also be expected to affect the outcomes of negotiations. Rubin and Brown (1975) summarize and attempt to synthesize an extensive experimental literature by using interpersonal orientation (IO) as a basic trait underlying individuals' approaches to bargaining. Briefly, their IO dimension "distinguishes bargainers on the basis of their sensitivity and reactivity to variations in the other's behavior" (1975: 294). Rubin and Brown make a convincing case for IO as a construct that is useful within a paradigm in which bargaining effectiveness is defined in terms of cooperation in simplified uniattribute negotiations (Swap & Rubin, 1983). However, in more complex negotiations in which tradeoffs among multiple issues are involved, and in which there is no abstract payoff matrix favoring mutual cooperation, other individual differences may produce a negotiating advantage. For instance, multiattribute negotiations require complex tradeoff decisions that call for cognitive skills. Thus intelligence, logical thought patterns, mental flexibility, and the ability to steer an opponent's thinking and keep the negotiation on track should enhance the likelihood of successful outcomes. Similarly, the pursuit of self-interest is likely to be affected by an individual's tendency to persist in interpersonal interactions, so that a more assertive negotiator will tend to have an advantage.

Because of the complexity of real-world negotiations it is necessary to measure a broad range of dimensions on which individuals can differ. The three general categories of relationship orientation, cognitive orientation, and persistence provide guidelines for ensuring that measures of personality sample the relevant range.

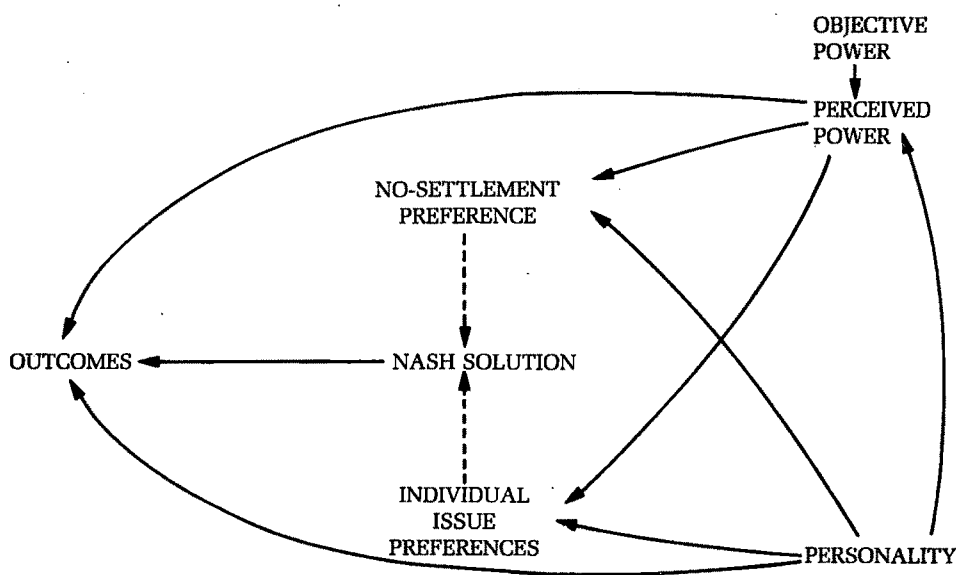
Integrating Power, Preferences, and Personality

Figure 1 shows the hypothesized relationships investigated in this research. Outcomes can be determined directly by personality, perceived power, and preferences. However, power and personality can also affect preferences and hence also have an indirect effect upon outcomes. For example, power could influence preference structure by raising a negotiator's utility for the no-settlement outcome. A powerful negotiator, almost by definition, has a high-utility resistance point because he or she has high-utility alternatives available for dealing with other parties. Personality could influence preferences because of individual differences in a negotiator's underlying preference structure, reflecting such factors as his or her unique reinforcement history and values.

The power variable is simpler than the multifaceted personality variable, although we distinguish objective from perceived power. Objective power is the negotiator's power position as manipulated using a simple experimental design with random assignment to conditions. Perceived power is the power position as subjectively assessed by the individual negotiator. Perceived power is hypothesized to be a mediating variable that directly affects outcomes and preferences.

The two elements of preference structure — individual issue utilities and the no-settlement utility — are combined in this research into a single rescaled preference measure, which in turn is used to understand how preferences

FIGURE 1
Hypothesized Relationships between
Personality, Power, Preferences, and Negotiated Outcomes



influence the actual outcome of the negotiation. More specifically, this preference measure is the individual's utility for the settlement prescribed by Nash's theory of cooperative games (1950, 1953), scaled relative to the individual's no-settlement utility.

Nash's theory has advantages in that it incorporates both parties' preference structures in prescribing a "fair" solution to any bargaining game, and it thus provides a convenient benchmark measure that should correlate with the actual outcome. The theory has been the focus of much attention in the bargaining literature (Bacharach & Lawler, 1981) and has been used in research in a manner similar to its application in this study.

The terms necessary for specifying the Nash solution are as follows:

Let

U_{ij} = utility (or preference) of negotiator i for settlement j ,

U_{io} = utility of negotiator i for the no-settlement outcome,

$i = 1, 2$, since we are concerned with dyadic bargaining,

and

j span the set of all possible settlements so that $U_{ij} \geq U_{io}$.

Then the Nash solution is the settlement that maximizes the product

$$(U_{1j} - U_{1o})(U_{2j} - U_{2o}) \quad (1)$$

(Luce & Raiffa, 1957: 126). Let j^* label the Nash settlement and j' label the actual settlement achieved. The relationship between preference and outcomes will be assessed by measuring the correlation between $(U_{ij^*} - U_{io})$ and $(U_{ij'} - U_{io})$.

Nash prescribes a fair solution in that it is the only settlement that satisfies the following four properties: Pareto optimality, equal payoffs if the game is symmetric, independence of irrelevant alternatives, and independence of the settlement with respect to utility function scale. For example, Pareto optimality requires that the prescribed settlement be such that no other settlement provides better payoffs to both negotiators.¹ Because of Nash's emphasis on fair outcomes, his solution provides an appropriate benchmark for achievements in negotiation: the direct effects of personality and power on outcomes (see Figure 1) are assessed in terms of how these factors cause deviations from the Nash solution.

METHODS

This study uses a contextually-rich simulation of an actual business negotiation to investigate the nature and extent of the effects of preferences, situational power, and negotiator personality on outcomes of negotiations. Preferences are measured with conjoint analysis as the multiattribute scaling

¹For further discussion of these properties see Davis, 1970: 104-107; or Luce and Raiffa, (1957: 121-134).

technique, situational power is manipulated, and personality is assessed by a variety of methods.

The Simulation

The situation simulated in this research is a purchase of prime-time television-commercial advertising. The situation involved an unplanned buy of as many as twelve 30-second spots (units) on the television show *M*A*S*H*. CBS was the seller and National Products was the buyer. In the scenario, National Products needs the television time to help launch a new breakfast cereal, and *M*A*S*H* is especially well-suited for the target market segment. Although *M*A*S*H* is one of CBS's most highly rated programs, there are rumors that Alan Alda, the star, may be leaving the show.

Both parties have an interest in completing a deal, but neither is compelled to come to a settlement irrespective of cost. Depending on the situational power manipulation, each party is described as more or less dependent on the other. The case provided other rich details about the situation. It was based on interviews with network, advertising, and corporation executives involved with the purchase of television time, as well as a review of relevant secondary sources.

Three issues need to be negotiated in the scenario. The first is the number of units to be purchased. Given the availability of spots as well as National Products' media schedule requirements, the number could range from eight to twelve. Second is a rating guarantee provision. A rating guarantee provided by CBS would state that in the event *M*A*S*H* did not achieve its usual 20 percent viewer rating, CBS would make up the difference in free additional spots. A guarantee of between 15 and 20 rating points was possible, while a guarantee of fewer than 15 was viewed as equivalent to no guarantee. This guarantee became a salient issue because of Alda's rumored departure, which could severely impair the show's future ratings. The third issue for negotiation is the price. Given the time of year, a cost per thousand viewers of between \$6.25 and \$6.75 is reasonable, reflecting the currently prevailing prices for spot purchases. All factorial combinations of the above three attributes are feasible settlements.

Subjects were randomly assigned the role of negotiator for either National Products or CBS. Each read a common background statement and a separate memo from his or her superior. The memo outlined the issues from the viewpoint of a buyer or seller, giving the negotiators a general idea of the importance of the issues to their adversary, and a detailed idea of the relative importance of the bargaining issues from the perspective of the constituencies they represented (Zartman, 1977).

Subjects

The subjects were 80 second-year M.B.A. students. While none of the subjects was a professional negotiator, all had prior business experience and were in the last weeks of a second-year elective course on negotiation skills; during the course, they had already participated in a series of more than a

dozen different negotiation simulations. They had not yet been exposed to Nash's theory.

Subjects were randomly assigned to dyads, which in turn were randomly assigned to power manipulation conditions. The relationships being investigated had not been discussed with the subjects, and there was no intersubject discussion of the negotiation until the study had been completed.

Preference Measurement

On the basis of previous experience in conducting negotiation experiments we expected that, despite specific instructions from the superior, each negotiator would develop a somewhat idiosyncratic assessment of the relative importance of the bargaining issues. After each participant had read the case material, we used conjoint analysis to measure his or her utility function for alternative settlements.²

Negotiator preference for the no-settlement outcome (the resistance point) was also measured by means of conjoint analysis.³ The utility for the no-settlement outcome would be an important dependent measure to investigate in itself because it is a function of situational power as well as of personality. Utilities for the possible set of outcome packages were rescaled relative to the no-settlement outcome, as required by Nash's theory.

Manipulation and Measurement of Situational Power

The situational power of both CBS and National Products was manipulated by adjusting the scenario to depict greater or lesser dependence of each party on the other. This was accomplished by means of supplementary role instructions that varied the number of alternative parties with which the subject could meet his or her needs. In the low-power condition, the subject was essentially dealing with a monopoly; otherwise, the subject had several viable alternatives.

Subjects were made aware that the M*A*S*H spot transaction represented only a small proportion of the annual business between CBS and National Products. Thus, in contrast to the episodic simulations used in typical studies of bargaining by experimental social psychologists, the M*A*S*H transaction was an event within a continuous relationship. In continuous relationships consideration of the possibility of retaliation and the importance of good will shapes negotiators' decisions in the immediate situation.⁴ A large proportion of real-world negotiations involves continuous relationships; therefore, in the interest of enhancing external validity, no attempt was made to remove this factor from the simulation.

²See Greenhalgh and Neslin (1981) for the application of conjoint analysis to a collective bargaining situation; see Scott and Wright (1976) for the application of conjoint analysis to measuring industrial buyer utility functions.

³See Greenhalgh and Neslin (1981) for a detailed description of how this can be accomplished.

⁴For a discussion of the effects of the episodic-continuous distinction on the exercise of power see Caplow (1968); for a specific application to negotiations, see Roering, Slusher, and Schooler (1975).

The situational power manipulations were conducted with 80 subjects; the 40 dyads were assigned 10 to each cell. To check whether subjects perceived the experimental manipulation as the researchers intended, a questionnaire was administered to subjects before and after each bargaining session. The questionnaire measured perceptions of which party, if either, had a situational power advantage.

Personality Measurement

Individuals differ in complex ways. To achieve content validity, it is necessary to depart from social psychology's traditional practice of measuring only one or two traits. In this study, personality data were collected that represented the general categories of relationship, cognitive, and persistence orientations described earlier. The exact measures used are listed in Table 1.

TABLE 1
Personality Constructs Measured

Relationship Orientation:	Cognitive Orientation:
Perspective-taking ability (Davis, 1980) ^a	Intelligence (Ammons & Ammons, 1962) ^d
Empathic concern (Davis, 1980) ^a	Structure (Fleishman, 1957) ^a
Introversion (Myers, 1962) ^a	Organization ^c
Feeling vs. thinking (Myers, 1962) ^a	Intuition-sensation (Myers, 1962) ^a
Consideration (Fleishman, 1957) ^a	Perceiving-judging (Myers, 1962) ^a
Masculinity (Bem, 1974) ^a	Tolerance of ambiguity (Budner, 1962) ^a
Femininity (Bem, 1974) ^a	Need for security (Blum, 1960) ^a
Sociability (Cheek & Buss, 1981) ^a	
Shyness (Cheek & Buss, 1981) ^a	Persistence:
Machiavellianism (Christie & Geis, 1970) ^a	Need for power (Winter, 1973) ^b
Need for affiliation (McClelland, 1958) ^b	Need for achievement (McClelland, 1958) ^b
Gregariousness ^c	Locus of control (Rotter, 1966) ^a
Inhibition ^c	Assertiveness (Rathus, 1973) ^a
Aggressiveness ^c	Management of stress ^c
Expressiveness ^c	Detail orientation ^c
Ability to compromise ^c	
Self-esteem ^c	Global Bargaining Skill^e

^aSelf-reported personality inventory

^bProjective test analyzed by a specialist

^cRated by a clinical psychologist after an in-depth interview

^dPaper-and-pencil test

^ePeer-rated

The fourth category appearing in Table 1 is a peer-group rating of each individual's global bargaining skill. Subjects had previously bargained with a set of seven other individuals in a series of dyadic, triadic, and intergroup negotiations. Thus, each member in a group of eight was familiar with the negotiating behavior of the other seven. Prior to the present study, each member had been asked to rate the other seven using a constant-sum paired

comparison scale. The average number of points ascribed to a given negotiator was used as that negotiator's peer-rated bargaining skill.

The various measures of individual differences were chosen and administered in such a way as to minimize the risk of problems stemming from common method variance. The series of self-report measures was administered in several batteries, each of which measured dissimilar constructs. The projective tests were analyzed by a trained specialist who was unfamiliar with the purposes of the study. The clinical psychologist conducting the individual assessments had no access to other data collected, nor was he familiar with the simulated negotiation. Finally, subjects rating their peers and later participating in the simulation did not know the specific hypotheses of the study.

Estimation of the Model

Our basic concern is to model what an individual achieves in a negotiation; thus the analysis is conducted at the individual level. Our dependent variable is the individual's rescaled utility for the three-component outcome ($U_{ij} - U_{io}$). The independent variables are that individual's personality, perception of his or her power position, and his or her rescaled utility for the Nash solution ($U_{ij*} - U_{io}$).

Specifically, outcome was measured in terms of the individual's utility for the actual outcome achieved as indicated by conjoint analysis, which reduced the three-component outcome to a unidimensional utility measure. Similarly, the Nash solution was operationalized as the individual's utility for the three-component outcome specified on the basis of Nash's theory. The Nash solution is generated by taking into account the issue and no-settlement preferences of both negotiators. Objective power was coded as a dummy variable reflecting the power manipulation. Perceived power was measured by means of questionnaire data gathered for the manipulation check. The battery of personality measures was factor-analyzed, and each individual's factor scores were used to estimate the relationships between personality and other variables.

The strength of each interrelationship shown in Figure 1 is measured by the magnitude of the squared multiple partial correlation coefficient (Blalock, 1979: 488). As Blalock notes, the advantage of this approach is that it accommodates the issues of multiple and partial correlation simultaneously; that is, it measures the multiple correlation between one dependent and several independent variables, partialing out the effects of other variables. The statistical significance of these relationships was assessed by means of an *F*-test that compared the increase in explanatory power achieved by including the particular variable (or set of variables) relative to what is unexplained by leaving it out (Blalock, 1979: 496).

RESULTS

Personality data were gathered over a 5-week period before subjects learned of the experiment. Then the 80 subjects were randomly assigned to

buyer or seller roles and preference data were collected. Next, buyers and sellers were randomly assigned to 40 dyads. The dyads were in turn randomly assigned to four power-manipulation conditions. The negotiations were conducted at a conference table and were observed by a researcher behind one-way glass. The negotiations took from 25 to 90 minutes to complete. None of the interactions resulted in impasse.

Preferences and Nash Solutions

Figure 2 displays the average utility structures for buyers and sellers. In particular, the figure shows the relative importance the average negotiator attached to each bargaining issue. These importances are reflected in the slopes of each line drawn in Figure 2. For example, the average CBS negotiator (seller) tended to attach a great deal of importance to achieving a high price while giving secondary importance to avoiding a guarantee and even less to selling all 12 units. The average National Products negotiator (buyer) also tended to emphasize price but was more concerned with avoiding the purchase of all 12 units than with obtaining a guarantee.

In summary, Figure 2 suggests that the most important source of conflict in the simulated negotiation was the price issue. Both buyers and sellers tended to attach the most significance to this issue. Guarantee was important to the seller but less so to the buyer. Units were important to the buyer but less so to the seller. It should be emphasized that the graphs in Figure 2 depict averages. Individual preference structures varied across subjects; as Figure 1 suggests, personality and perceived power should explain some of the variation in preference structure.

Table 2 summarizes the no-settlement preferences for each cell in the experimental design. As expected, the table shows that negotiators in low-power situations have lower preferences (or utilities) for the no-settlement outcome because they wish to avoid this outcome.

The data summarized in Figure 2 and Table 2 were used to calculate the Nash solution for each dyad by means of a search procedure. Given the individual issue preferences and no-settlement preference for each negotiator,

TABLE 2
Negotiator Preferences for the No-Settlement Option

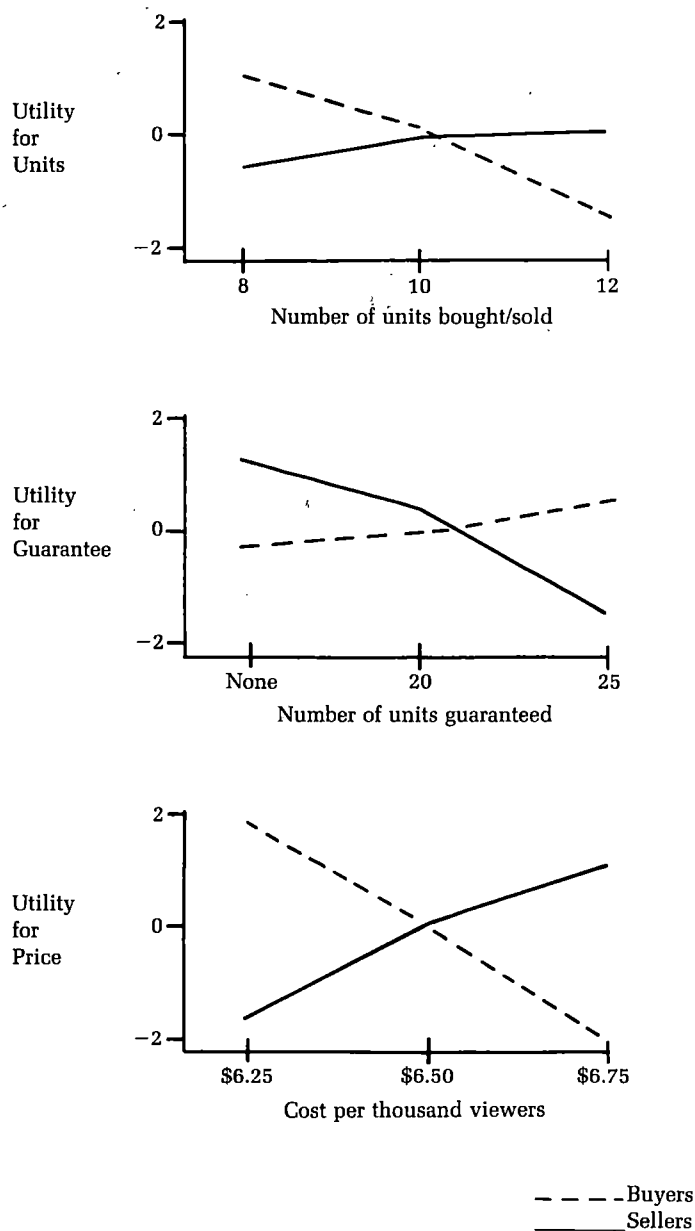
Buyer			Seller		
Cell	Power	Mean Preference Level ^a	Cell	Power	Mean Preference Level ^a
1	Low	-2.23	1	Low	-1.82
2	Low	-1.54	2	High	-1.22
3	High	-.75	3	Low	-2.03
4	High	-.30	4	High	-1.03
$F_{3,36} = 8.84^{**}$			$F_{3,36} = 2.75^*$		

^aPreference is scaled so that larger number means greater preference.

* $p < .10$

** $p < .01$

FIGURE 2
Average Negotiator Preferences for the Three Different Attributes^a



^aThe y-axis is the utility or preference scaled so that positive numbers indicate greater preference. The graph is of average preferences, calculated across all buyers and across all sellers.

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a computer program was used to search among all possible outcomes for the outcome that maximized the product of negotiators' utilities scaled relative to the no-settlement preference (see Equation 1). The scaled utilities that maximized this product were used as independent or dependent variables according to the relationships displayed in Figure 1. Because preference structures varied across subjects, Nash solutions varied across dyads.

Situational Power

Situational power was manipulated by varying objective power (Rubin & Brown, 1975; 213). Perceived power should be directly related to outcomes and preferences. Table 3 depicts the relationship between objective and perceived power. The data in Table 3 can also be viewed as a manipulation check, testing whether the objective power manipulation was perceived as desired. These data were also used to operationalize the perceived power variable shown in Figure 1. The table indicates that participants correctly perceived their power situations. These perceptions persisted both before and after the simulated negotiations.

TABLE 3
Participants' Perceptions of Power Situations

Experimental Condition	Mean Perceptions of Power ^a	
	Prenegotiation	Postnegotiation
Equal low power	3.85 (.21)	3.90 (.19)
Buyer more powerful	2.50 (.15)	2.95 (.21)
Seller more powerful	5.05 (.18)	4.75 (.23)
Equal high power	3.83 (.22)	3.78 (.17)
<i>F</i> _{3,76}	30.31*	13.47*

^aPerceptions were measured on a 7-point scale; 7 means that the seller was in a better bargaining position than the buyer. Each mean consists of 20 observations (10 dyads × 2 negotiators per dyad). Standard errors are in parentheses.

**p* < .0001

Personality

The 31 personality variables were reduced to 10 independent dimensions by means of factor analysis. The specific technique used was the SPSS principal factoring method with iteration using varimax rotation (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). To check on the advisability of using orthogonal rotation on variables that might be related, we also generated an oblique rotated solution. The oblique solution matched the orthogonal solution; therefore further analysis proceeded, using the factor scores generated from orthogonal rotation in the multiple partial correlation analysis. Our use of factor analysis is consistent with the approach taken by other researchers faced with the task of reducing a large number of personality variables (Browne & Howarth, 1977; Cattell & Delhees, 1973; Guion & Elbert, 1973; Klingler & Saunders, 1975; Skinner, Fretson, & Howarth, 1973).

A ten-factor solution was used for two reasons: First, the ten factors were easy to interpret. Second, the tenth eigenvalue was the last to be above 1.0, the traditional cutoff point. The ten factors accounted for 70.7 percent of the variance in the original variables. The matrix of factor loadings and the interpretation of each factor are displayed in Table 4.

Model Estimation Results

Figure 3 displays the squared multiple partial correlation coefficients that represent the interrelationships among preferences, power, personality, and outcome. As described earlier, an *F*-test was used to assess the statistical significance of these correlations; these results are also presented in Figure 3.

The results show that negotiator preferences have the strongest direct influence on outcomes. As noted earlier, these are almost never measured in laboratory research; instead, preferences are assumed to correspond with role instructions. The results also show that neither power nor personality has a significant direct effect on outcomes. Power affects the resistance point, as would be expected, since power is defined in terms of dependence on the other. Power also affects the hierarchy of issue preferences. Personality affects preference structure and perceived power. Although both power and personality have an influence on negotiated outcomes, neither variable directly determines outcomes; their effects are mediated by preference structures.

The most immediate implication of this finding for further research is that the effects of power and personality on negotiated outcomes cannot be adequately investigated without considering preferences. Preferences must therefore be explicitly measured and not assumed to be uniform across individuals.

Although the focus of this research is on the overall empirical relationships summarized in Figure 3, Tables 5, 6, and 7 have been included to show the detailed regression results on which Figure 3 is based. Table 5 shows that the Nash solution was strongly related to actual outcomes, while none of the personality or power variables had a significant effect.

Table 6 shows that perceived power has a significant effect on no-settlement preferences. As Figure 3 shows, the overall effect of personality upon no-settlement preferences is not statistically significant. Thus, we feel it is not appropriate to draw conclusions about the individual personality coefficients in Table 6. First, our focus in this research is on the overall effect of the personality variables. Second, when conducting several hypothesis tests, one runs the risk of finding some significant results simply by chance. The insignificant overall effect in Table 6 suggests that this might have occurred in the cases of the two marginally significant coefficients ($p < .10$) obtained.

Table 7 shows the relationships between particular personality variables and preference structures as well as perceived power. Since the aggregate relationships are significant for units preference and perceived power (see

TABLE 4
Factor Analysis of Personality Measures
(Varimax Rotated Factor Loadings)

Personality Measures ^b	Factors ^a									
	1	2	3	4	5	6	7	8	9	10
Feeling orientation (SR)	.74	.02	.23	-.14	.15	.02	-.03	-.03	.07	-.14
Masculinity (SR)	-.63	.08	.14	.18	.05	.02	-.07	-.16	.05	-.02
Empathic concern (SR)	.60	.00	.35	-.11	.00	.10	.22	-.14	.01	.20
Need for security (SR)	.50	.00	-.47	-.14	-.14	.11	-.40	.11	.13	-.14
Femininity (SR)	.49	-.10	.09	.22	-.09	.29	-.04	-.31	.09	-.05
Aggressiveness (CI)	-.49	.44	.08	.22	.10	.24	-.28	.18	.07	.18
Ability to compromise (CI)	-.44	.11	-.07	.08	.28	.03	-.15	.02	.35	.30
Gregariousness (CI)	.02	.76	-.08	.13	.02	.16	.10	-.12	.00	.01
Inhibition (CI)	.14	-.67	.04	-.06	-.13	.04	-.01	-.07	.03	-.02
Introversion (SR)	.05	-.61	.05	-.38	-.21	-.08	-.14	.41	-.12	-.13
Expressiveness (CI)	.01	.59	.02	.01	-.09	-.20	-.12	.21	.33	-.09
Sociability (SR)	.05	.35	-.06	.07	.18	.35	.28	-.28	.12	.02
Perception-orientation (SR)	.12	.01	.77	-.07	.22	.07	.13	-.08	.07	.05
Intuitiveness (SR)	.06	-.06	.74	-.05	-.01	-.07	.01	-.03	-.14	-.01
Ambiguity tolerance (SR)	-.01	-.03	.54	.16	-.08	.01	.13	.01	.13	-.13
Organization (CI)	-.01	.08	-.54	.23	.05	-.37	.20	-.01	-.08	-.07
Shyness (SR)	.26	-.36	-.06	-.78	.01	-.02	-.07	.01	-.03	-.01
Assertiveness (SR)	-.40	.14	-.02	.71	.13	.16	-.12	.02	-.06	.00
Detail-emphasis (CI)	-.17	.01	-.27	.37	-.16	-.15	.12	.10	.03	-.05

TABLE 4 (continued)

Personality Measures ^b	Factors ^a									
	1	2	3	4	5	6	7	8	9	10
Need for power (PT)	-.10	.13	.12	-.09	.62	.09	-.07	.04	-.15	.14
Need for achievement (PT)	-.01	.08	-.01	.16	.62	.07	.31	-.13	.05	-.07
Bargaining skill (PR)	-.30	.13	-.01	.00	-.40	.14	.14	-.16	-.05	.39
Perspective-taking (SR)	.20	.00	.17	.06	-.20	.62	.39	-.07	-.03	.04
Management of stress (CI)	.02	.00	-.01	-.01	.30	.48	-.07	.04	.00	-.04
Self-esteem (CI)	-.34	.22	.02	.28	.04	.47	.07	.19	-.21	.11
Consideration-LOQ (SR)	.15	.09	.14	.01	.04	.00	.07	.01	.07	.15
Intelligence (PP)	-.00	.00	-.09	.05	-.01	.05	-.02	.84	-.02	.04
Need for affiliation (PT)	-.00	.15	-.03	-.13	-.02	-.05	.04	.06	.65	-.12
Machiavellianism (SR)	-.12	.01	-.15	-.16	.14	-.05	-.07	.26	-.51	-.12
Internal locus control (SR)	.27	.17	-.03	-.27	-.21	-.05	-.35	.04	-.37	-.12
Structure-LOQ (SR)	-.03	.00	-.01	-.02	.05	-.01	-.12	.05	-.02	.78

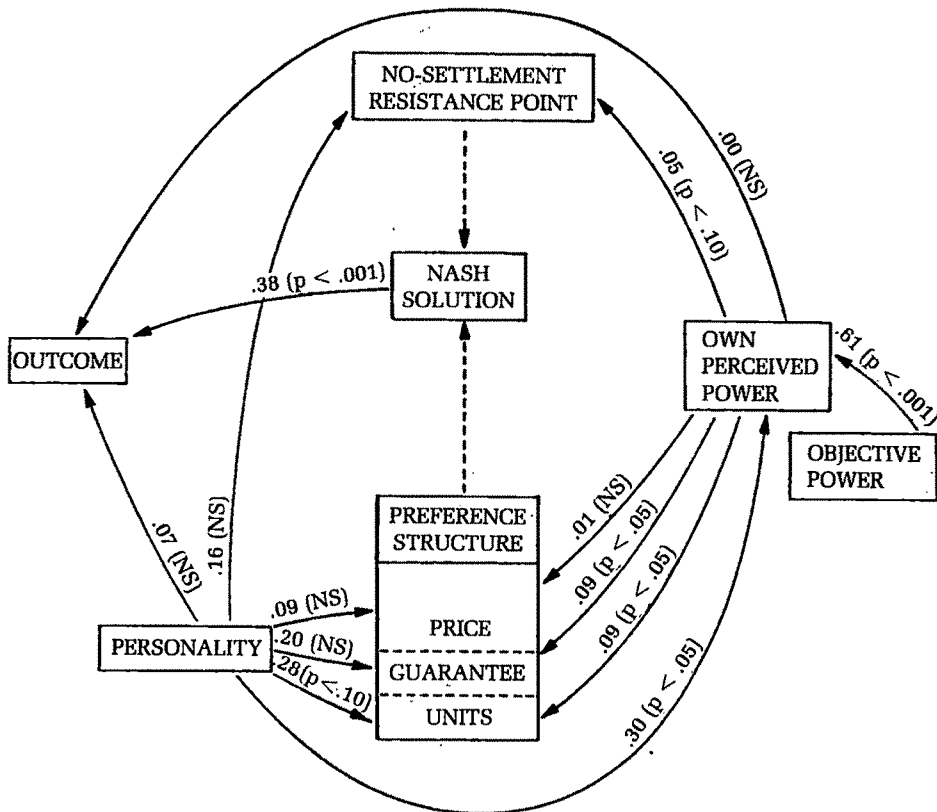
^aKey to interpretation of factors:

- 1 Accommodating
- 2 Outgoing
- 3 Open-minded
- 4 Assertive
- 5 Driven
- 6 Empathic
- 7 Considerate
- 8 Intelligent
- 9 People-oriented
- 10 Task-oriented

^bKey to method of measurement (in parentheses):

- CI = Clinical interview
- PP = Paper and pencil test
- PR = Peer rating
- PT = Projective test
- SR = Self-report

FIGURE 3
Interrelationships between Negotiated Outcomes
and Their Determinants^a



^aValues on paths are squared partial correlations; NS indicates nonsignificance.

Figure 1), it is appropriate to examine individual coefficients. In particular, our findings are that less outgoing, more considerate, and more intelligent subjects put less emphasis on the number of units purchased.

DISCUSSION

This research has (1) specified a model of bargaining outcomes that integrates personality, power, and preferences and (2) estimated the model with data from a contextually-rich simulated business negotiation. The research emphasized rigorous measurement of all variables, some of which are seldom measured in bargaining research. In particular, we explicitly

TABLE 5
Results of Regression Analysis of Utility for
Actual Outcomes^a on Negotiator Preferences,
Perceived Power, and Personality Dimensions

Independent Variables	Standardized Regression Coefficient	t
Negotiator preferences:		
Utility for Nash settlement ^b	.621	5.90*
Perceived power	-.019	.16
Personality dimensions: ^c		
Accommodating	-.044	.45
Outgoing	.026	.26
Empathic	.075	.77
Considerate	-.006	.06
People-oriented	.061	.62
Open-minded	-.052	.53
Assertive	.050	.52
Driven	-.055	.57

$R^2 = .476$; $F_{12,57} = 4.32^*$

^aUtility for actual outcomes = $U_{ij'} - U_{io}$

^bUtility for Nash settlement = $U_{ij*} - U_{io}$

^cFactor scores

* $p < .001$

TABLE 6
Results of Regression Analysis of No-Settlement Utility
on Perceived Power and Personality Dimensions

Independent Variables	Standardized Regression Coefficient	t
Perceived power	.24	1.80*
Personality dimensions ^a		
Accommodating	.10	.88
Outgoing	-.01	.11
Open-minded	-.13	1.06
Assertive	-.04	.34
Driven	.04	.34
Empathic	-.22	1.89*
Considerate	.00	.00
Intelligent	.14	1.11
People-oriented	-.23	1.98**
Task-oriented	.04	.35

$R^2 = .216$; $F_{11,58} = 1.45$ (n.s.)

^aFactor scores

* $p < .10$

** $p < .05$

TABLE 7
Results of Regression Analyses of Preference Structures
on Objective and Perceived Power and Personality Dimensions

Dependent Variables:		Price Preference		Guarantee Preference		Units Preference		Perceived Power	
Independent Variables		β	t	β	t	β	t	β	t
Objective power		—	—	—	—	—	—	.72	9.48***
Perceived power		-.10	.70	.29	2.32**	-.28	2.32**	—	—
Personality dimensions ^a									
Accommodating		-.14	1.13	-.02	.20	-.00	.02	-.01	.06
Outgoing		-.03	.25	-.15	1.31	.28	2.47**	.02	.20
Open-minded		-.11	.85	.23	1.98**	-.04	.32	.00	.04
Assertive		-.05	.36	-.05	.44	-.02	.14	.03	.38
Driven		.01	.06	-.03	-.24	.03	.27	-.08	1.12
Empathic		.05	.37	.03	.24	-.03	.25	-.09	1.26
Considerate		.04	.29	.22	1.77*	-.34	2.89**	-.24	3.20**
Intelligent		.13	.99	.19	1.61	-.27	2.38**	-.20	2.74**
People-oriented		.02	.17	-.00	.02	.07	.61	.03	.40
Task-oriented		-.19	1.49	.21	1.82*	-.18	1.61	-.14	1.99**
R^2		.10		.24		.30		.71	
$F_{11,58}$.57		1.64		2.29**		12.63***	

^aFactor scores

* $p < .10$

** $p < .05$

*** $p < .001$

recognized that negotiators form idiosyncratic preference structures and measured those preferences using conjoint analysis. Furthermore, we took into account the role of perceived situational power and antecedent objective power. A personality/power/preference model was estimated by means of multiple partial correlations — a technique particularly suited for measuring the aggregate effect of one set of variables on a dependent variable while partialing out the effect of a second set of variables.

The most notable finding of this research is that negotiator preferences are the direct determinants of bargaining outcomes and that the effects of personality and power, although significant, are mediated by these preferences. The main implication of this result for future research is that all three variables — personality, power, and preferences — should be considered in any bargaining study. To study only preferences leaves out two weaker, but potentially important driving forces behind the negotiation: power and personality. To omit preferences leaves out the crucial mediating variable that translates personality and power into a negotiated outcome. The main implication of this research for practicing negotiators is that they should strive to understand their adversaries' preferences and make sure that their own preferences clearly reflect the desires of their constituencies. These preferences will have a direct impact on the final negotiated outcome.

While the results of this research were based on rigorous measurement procedures and a carefully designed simulation, we used only one such simulation to test the model, and thus acknowledge the need to replicate this work. In addition, our sample size of 80 individuals was not as large as it ideally might have been. We feel this is a necessary, and, on balance, acceptable cost for the detail and volume of data on preferences and personality collected for this research. Nevertheless, the sample size prevented us from examining more complicated personality models — for example, second-order models that could be estimated using LISREL.⁵

In conclusion, our investigation of the role of preferences, power, and personality in determining the outcomes of negotiations has yielded stimulating and useful results. We are confident that the model and procedures described here can be applied to different bargaining experiments and hope that future researchers will expand and improve upon this work as they strive to understand bilateral influence processes.

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⁵Bearden, Sharma, and Teel (1982) showed that the chi-square fit test used in LISREL is inaccurate (in the direction of too often rejecting a model) for complex models with fewer than 200 observations.

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ERRATA

In Provan (AMJ, 27: 811-829), Hypothesis 3 on page 817 should have read: "The higher the level of *joint* programs experienced by an agency, the higher the proportion of its clients that are likely to be referrals from other organizations as well as to other organizations." The word *joint* was omitted in the published version.

Also, in Table 5 on page 826: Neither the number of organizations in joint programs ($\beta = .21$) nor the percentage of clients in joint programs ($\beta = .12$) in the first regression equation (referrals from other organizations) are statistically significant findings.

THE EFFECTS OF FRAMING AND NEGOTIATOR OVERCONFIDENCE ON BARGAINING BEHAVIORS AND OUTCOMES

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Two systematic biases—the framing of conflict and negotiator overconfidence—are suggested as possible influences on negotiator behaviors. To investigate these biases, 100 subjects were asked to negotiate a five-issue contract under controlled conditions. Results indicated that (1) a positive frame led to more concessionary behaviors and successful performances than a negative frame and (2) realistically confident subjects exhibited more concessionary behaviors and successful performances than subjects who were overconfident. Implications of the results of this study for third-party intervention and the training of negotiators are discussed.

The negotiation literature has strived to identify elements of the bargaining situation that enhance the resolution of conflict (Kochan, 1980). Routinely, it has focused on negotiator differences (Rubin & Brown, 1975), third party impasse procedures (Grigsby & Bigoness, 1982; Kochan, 1980; Kochan & Baderschneider, 1978; Rubin, 1980), or various normative models that predict negotiator behavior (Fisher & Ury, 1981; Nash, 1950; Raiffa, 1982). The literature has not, however, specified the ways in which negotiators deviate from rationality and actually make decisions within the bargaining context. The purpose of this paper is to explore the effects of systematic biases on the negotiation process.

FRAMING AND OVERCONFIDENCE BIASES

Since March and Simon's (1958) delineation of the concept of bounded rationality, specifying human judgment as deviating from rationality in predictable ways, researchers have made considerable efforts to identify the decisional heuristics inherent in human decision making (cf., Pitts & Sachs, 1984). These heuristics or "rules of thumb" are generally quite useful in reducing the amount of information to be processed. However, there are

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certain situations in which these judgmental heuristics have been shown to bias decisional outcomes in systematic ways (Einhorn & Hogarth, 1978; Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980). Although there are a number of decisional biases that have been identified (Kahneman, Slovic, & Tversky, 1982), this study will examine two biases that are particularly likely to influence negotiator behavior. In both cases, we will argue that the systematic bias reduces the likelihood of resolution and decreases the quality of the final contract obtained by the biased negotiator. Specifically, this paper examines the impact on negotiations of negotiators' (1) framing conflict in terms of avoiding losses, as opposed to obtaining gains, and (2) being overconfident of the acceptability of their bargaining positions. We chose these two biases as representatives of the population of decisional biases because we had an *a priori* expectation concerning the impact of these two decision biases on concessionary behavior, and thought that evidence regarding this expectation will be important in improving dispute resolution techniques. Prior to any further development of the study, it is important to give an overview of the framing and overconfidence biases by (1) describing each particular bias, (2) relating each bias to the negotiation process, and (3) specifying predictions that flow from the application of these two biases to the negotiation situation.

Framing

Kahneman and Tversky's (1979; Tversky & Kahneman, 1981) prospect theory has suggested that decision makers treat the prospect of gains and losses quite differently. Consider the following example from Tversky and Kahneman (1981: 453):

The U.S. is preparing for the outbreak of an unusual Asian disease which is expected to kill 600 people. Two alternative programs are being considered. Which would you favor?

1. If Program A is adopted, 200 people will be saved.
2. If Program B is adopted, there is a 1/3 probability that all will be saved and a 2/3 probability that no one will be saved.

Of the 159 respondents, 76 percent chose Program A — the certain outcome — while 24 percent chose Program B — the risky outcome. The prospect of being able to save 200 lives for certain was more attractive than a risky prospect of equal expected value. A second group of subjects received the same cover story with the following options:

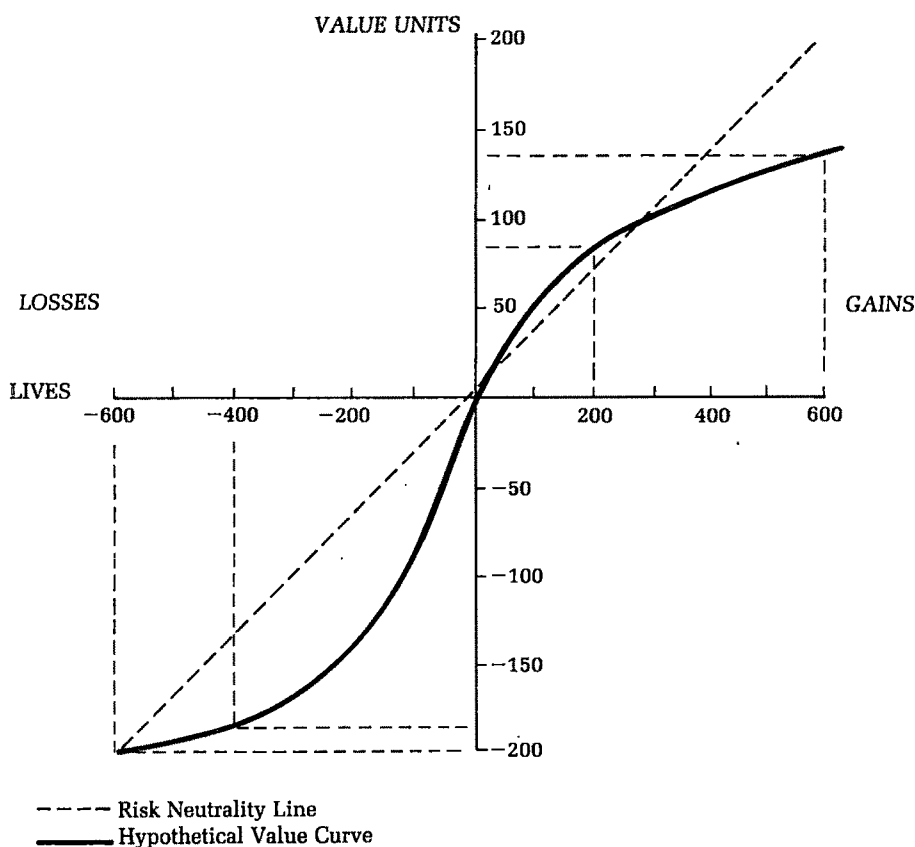
1. If Program A is adopted, 400 will die.
2. If Program B is adopted, there is a 1/3 probability that no one will die and a 2/3 probability that all will die.

Of the 169 respondents, only 13 percent chose the certain outcome of Program A while 87 percent chose the risky outcome of Program B. That is, the prospect of 400 people dying for certain is less acceptable than a 2/3 probability that 600 people will die, although the expected values of the two choices are equivalent. Based upon these and related findings (Kahneman & Tversky, 1979; Thaler, 1980; Tversky & Kahneman, 1981), individuals are risk-averse — preferring a certain outcome over a risky one — when evaluating the pros-

pect of gains. Further, Kahneman and Tversky's (1979) prospect theory states that potential gains and losses are evaluated relative to their effect on current wealth. Choice is explained by an S-shaped value function—a value function that is convex, indicating a risk-averse orientation, for gains and concave, indicating a risk-seeking orientation, for losses. This figure shows that the value placed on saving 200 lives is more than one-third of the value placed on saving 600 lives. In contrast, the value loss suffered by losing 600 lives is not three times as great as losing 200 lives.

Consider a hypothetical labor-management situation. The union claims they need a raise to \$12/hour, and that anything less would represent a loss to employees given the current inflationary environment. In contrast, management claims that they cannot pay more than \$10/hour, and that anything

FIGURE 1
Hypothetical Value Function Accounting for Framing



Note: Modified from Kahneman and Tversky (1979)

more would impose an unacceptable loss to the company. In this simplified one-issue case, what if each side had the option of either settling for \$11/hour or going to arbitration? Since both parties typically view negotiation in terms of what they have to lose, following Kahneman and Tversky's (1979) basic propositions, they will respond in a risk-seeking manner and are likely to choose arbitration.

Theoretically, for arbitration to be an effective impasse procedure, it must be infrequently used (Feuille, 1977). A usual explanation for the lack of use of more successful forms of arbitration (e.g., final offer by package arbitration) is that these forms impose costs on the participants for their having resorted to impasse. Examples of the costs of arbitration include (1) the additional time commitment of the participants required in the arbitral process, (2) the fees and expenses of the arbitrator, (3) the increased uncertainty of the outcome—as the parties no longer have control over the final outcome—and (4) the lowered quality of the final outcome. The quality of the arbitrated award is lower than that of a negotiated agreement, assuming that the parties at conflict can better fashion a contract that meets their needs than can a neutral third party (Crawford, 1979). Thus, an arbitration award of an \$11 hourly wage can be expected to be of lower quality than a negotiated contract including an \$11 hourly wage.

Changing the subjective gain/loss situation, given the same objective situation specified above, results in a very different predicted outcome. If the union views anything above \$10/hour as a gain and management views anything under \$12/hour as a gain, then a positive frame will exist, risk aversion will tend to dominate, and negotiated settlement will generally occur. The implication of the above framework is critical. Both sides in negotiations often talk in terms of why they need a certain wage—they talk in terms of losses. What if they believe themselves? The first scenario above provides the answer! They will adopt a negative frame, exhibit risk-seeking behavior, and increase the likelihood of their reaching impasse because of a general reduction in concessionary behavior. Specifically, as suggested by Farber and Katz (1979), a risk-seeking orientation—such as that resulting from evaluating the prospect of losses—will lead to an increased likelihood of reaching impasse and invoking arbitration. Conversely, a risk-averse orientation—such as that resulting from evaluating the prospect of gains—will lead to an increased likelihood of reaching a negotiated settlement. In addition, because the negative frame is posited to increase the frequency of impasse, the quality of the outcomes determined by third party intervention should be lower than that obtained by reaching a negotiated settlement, as the two parties should be able to reach an agreement superior to that imposed by a third party (Crawford, 1979).

Negotiator Overconfidence

Negotiator overconfidence represents a second bias that reduces concessionary behavior and negotiator success in reaching agreement. While research

on clinical judgment, decision making, and probability estimation has demonstrated many systematic deviations from rationality, evidence also shows that individuals have unwarranted confidence in their fallible judgment (Einhorn & Hogarth, 1978). Realistically confident individuals should, for example, be accurate on 80 percent of the judgments to which they give confidence judgments of 80 percent. Laboratory studies, however, find overconfidence to be common. For example, for a large group of two-choice questions for which subjects were 75 percent confident that their judgment was correct, typically only 60 percent of the questions have been correctly answered. For confidence judgments of 100 percent, it is common for subjects to be correct only 85 percent of the time (Fischhoff, 1982). Finally, when people put confidence intervals around numerical judgments (e.g., "I am 95 percent certain that there are between 500 and 700 pennies in the jar"), it is common for the actual number (of pennies) to fall outside the 95 percent boundaries for 50 percent of all subjects (Bazerman & Neale, 1983).

The level of confidence with which the negotiator evaluates the likelihood of a particular offer being accepted specifically addresses this issue of probability assessment. As Einhorn and Hogarth (1978, 1981) and Lichtenstein, Fischhoff, and Phillips (1982) demonstrate, people generally tend to be overconfident in judging their chances of success. One of the primary goals of negotiation is to convince an opponent of the feasibility of the focal negotiator's offer and the unfeasibility of the opponent's offer. One probable result of this process is that negotiators may well convince themselves that their particular offers are obviously more equitable and would therefore be chosen by the arbitrator should impasse be declared. Unless negotiators are able to take their opponent's perspective, they are likely to underestimate the value of their opponent's position (Neale & Bazerman, 1983), a tendency that would then lead to their attaching a higher probability to the arbitrator's accepting their offers than is realistic.

Bazerman and Neale (1982) have found that the higher negotiators evaluate their probability of success to be, the less concessionary will be their behavior. The more secure negotiators are of their current offers being accepted by arbitrators, the less they will compromise on final offers. Negotiator overconfidence is the norm. They (Neale & Bazerman, 1983) have also found that, while in the aggregate only 50 percent of all final offers can be accepted, subjects believed that, on the average, they had a 65.4 percent chance of final offer acceptance by the arbitrator in final offer by package arbitration. This overestimation of the probability of success can have serious consequences for the outcome of a negotiation. If negotiators had more accurately assessed the likelihood of success, they might have behaved quite differently in terms of concessionary behavior and information gathering in order to raise the probability of success to a more acceptable level. Overconfidence should decrease negotiators' willingness to concede as they will have misjudged the amount of compromise necessary to reach resolution. Thus, we posit that overconfidence results in lower resolution rates and less successful outcomes.

Our predictions concerning the effects of framing and overconfidence on negotiator behaviors can be formally stated as follows:

Hypothesis 1. Negotiators who frame negotiations in terms of losses will use less concessionary processes during the negotiation and have less successful outcomes than will negotiators who frame negotiations in terms of gains.

Hypothesis 2. Individuals who are overly confident about the accuracy of their judgment of the probability of success in final offer arbitration will use less concessionary processes and have less successful outcomes than will those who are realistically confident about the accuracy of their judgments.

METHODS

Subjects

One hundred male and female undergraduate students from the College of Business Administration at the University of Texas who were enrolled in the upper-division management course volunteered to participate in this experiment. They were told that they were participating in a study of bargaining behavior.

Procedure

Two independent variables were employed in a 2×2 factorial design. Factor A was a negative or positive frame of the bargaining situation resulting from a memorandum presented to the subject. Factor B was the level of negotiator confidence (realistic confidence vs. overconfidence) in securing a successful outcome. Because of the nature of the manipulations, eight experimental confederates who were unaware of the theoretical basis of the experiment served as the union negotiators. They had extensive practice in the negotiation simulation and used a strategy of reciprocal concessions (reciprocity norm) (Esser & Komorita, 1975). While there is research suggesting that negotiators do not follow a straight reciprocity strategy (Hartnett & Cummings, 1980), or any other one strategy consistently, we chose this particular strategy to limit, to the extent possible, the amount of experimental "noise" generated by the confederates. Thus, the choice of a consistent negotiating strategy was one mechanism to reduce the impact of multiple confederates with different negotiating styles.

In addition to the extensive practice in the negotiation simulation, the confederates got instructions to secure the best contract they could for the union given certain constraints. These constraints consisted of (1) a specific starting position in the negotiation—the union's initial offer—and (2) matching opponents' concessions with their own. Further, the confederates were

unaware of the decision-rule nature of the arbitration decision. Their ignorance of the decision-rule was, in part, a function of the opponents' asymmetric valuations of the issues and the confederates' lack of knowledge of this aspect of the game. That is, some issues were of greater value to the union than to management and neither party had access to the other's valuation.

Upon arriving at the experimental site, subjects were assigned the roles of management negotiators while the confederates were assigned the roles of union negotiators. It might be interesting from a framing perspective to determine if the role affects the negotiator's frame. Traditionally, the union may be positively framed by virtue of seeking contractual increases — gains — while management may be negatively framed by being requested to give up value to the union. Of course, with the recent union "givebacks," the customary frame of these two institutions may be reversed. However, the goal of this study was limited to determining if framing had any systematic effect on negotiator behavior in the context that the study set up.

We then randomly assigned subjects to one of four experimental conditions: negatively framed, overconfident; negatively framed, realistically confident; positively framed, overconfident; or positively framed, realistically confident. Confederates were blind as to the particular assigned condition of their opponents; confederate-subject pairs were of the same sex.

The frame condition was manipulated by means of a memorandum to the negotiator from the personnel director. For both conditions, all objective information was identical. That is, a number of settlement points on each of five issues were identified. Each settlement point was coupled with a figure that represented the net gain or loss in dollars for settling at that particular point. In the negatively framed condition, subjects were informed that:

Any concessions beyond those granted will represent serious financial losses to the company. Please remember that your primary objective is to minimize such losses to the company. I cannot emphasize the severity of this situation enough. It is mandatory that you, as Townsford's representative, secure the necessary concessions from the union to reduce our losses to a tolerable level.

In the positively framed condition, subjects received the following instructions:

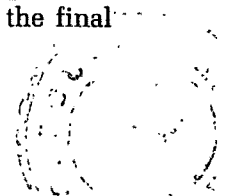
Any union concession from their current position will result in gains for the company. Please remember that your primary objective is to maximize such gains for the company. I cannot emphasize the importance of these gains to Townsford enough. It is mandatory that you, as Townsford's representative, secure such concessions from the union to increase these gains to a meaningful level.

After receiving and reading an informational packet (Grigsby & Bigoness, 1982) consistent with their assigned role and frame, participants received instructions concerning the upcoming negotiation. In addition, the consequence of reaching impasse—final offer by package arbitration—was explained to them. This explanation was coupled with a rather detailed written description of the particular arbitration process that could occur. After the subjects had read the packets and listened to the explanations, any questions they

had concerning the negotiation or arbitration process were answered. Subjects then participated in a practice negotiating session with a confederate negotiator in the union role. This confederate was not the same individual the subject would oppose in the actual negotiating session. The purpose of the 15 minute practice negotiating session was to familiarize subjects with the content of the bargaining simulation as well as to allow them the opportunity to develop and list arguments to support their positions.

After the practice session, the portion of subjects previously assigned to the realistically confident condition participated in a training session focusing on their tendency to overestimate their probability of success. The training consisted of a discussion and illustration of the overconfidence with which individuals imbue their fallible judgments. That is, subjects assigned to the realistically confident condition were told that negotiators routinely overestimated their likelihood of being awarded the contract in final offer arbitration. Subjects were also told that, on the average, respondents in an earlier study indicated that they had a 65.4 percent chance of their final offers being accepted. The experimenter then suggested that this figure indicated a state of overconfidence, since only one of the two final offers would be accepted—there was only a 50 percent chance of the average final offer being accepted. During the training of this realistically confident group, the experimenter specifically avoided any reference, explicit or implicit, to behaviors that could result from a more realistic level of confidence. The training consisted only of informing the subjects that such a tendency existed. The other half of the subjects, those assigned to the overconfident condition, received no training. We expected that a lower estimation of their probability of success would be the subjects' obvious behavioral response to the training; we thought an interesting response on their parts would be their increasing their probability of success by fashioning more equitable contracts through additional concessionary behavior.

Once the training session was complete, the negotiating opponents bargained for 20 minutes. The confederate union negotiator initiated the bargaining process by presenting the first proposal on the issues. The five issues negotiated were vacation pay, hospital (medical) plan, wages, paid sick days, and night shift differential. All issues were presented to the subjects at the same time and the participants were free to negotiate these issues in whatever manner they chose. If, after 20 minutes, they had not reached resolutions, negotiators were asked to submit a final offer to the arbitrator and to then estimate the probability that this final offer would be accepted. The arbitrator then chose the final offer that was least costly to the opponent; that is, management's final offer was evaluated in terms of what it would cost union, and union's final offer was evaluated in terms of what it would cost management. The final offer chosen was the one that exacted the least cost from the opponent—in other words, represented the greatest overall concession rate. The negotiators involved were then informed of the arbitral outcome and the specifics of the contract. On the other hand, if the negotiators reached a resolution, they were simply asked to sign a copy of the final



contract. We then asked all subjects to complete a short questionnaire assessing their evaluation of the contract and the means by which they secured that contract.

Measures

The hypotheses concerned the prediction of two dependent variables: (1) concessionary processes, and (2) successful outcomes. Concessionary processes were measured in three ways: (a) amount of concession (b) number of issues resolved during the negotiation session, and (c) level of competitiveness. Amount of concession was measured by the dollar difference between subjects' initial positions and their contracts if resolution was reached, or by final offers in cases of impasse. The number of issues resolved was measured by how many of the five issues the negotiators reached agreement on. Level of competitiveness experienced by subjects was measured by summing their opponents' responses to four 7-point agree/disagree items ($\alpha = .81$). The following is a sample item: "My opponent was very competitive in his/her bargaining stance."

Successful outcomes were also measured in three ways: (a) whether or not resolution occurred, (b) dollar value of final contracts to management negotiators, and (c) subjects' perceptions of the fairness of the contract. Each of these interrelated measures represents a valued outcome to management negotiators. The dollar value of the contract was measured as the sum of the dollar gains (savings) or losses (costs) to the company for that particular settlement point across all five issues. If all five issues were agreed upon during negotiation, then resolution was reached. Finally, perceived fairness was measured by summing the subjects' responses to six 7-point agree/disagree items ($\alpha = .78$). The following is a sample item: "The offers made by my opponent were fair."

Finally, we obtained measures for checking each of the manipulations. The framing manipulation was verified by measuring the subjects' expected, acceptable bargaining outcome prior to negotiation (predicted outcome). The manipulation check, although somewhat indirect, focused on what the negotiator viewed as an acceptable settlement. Extrapolating from Farber and Katz (1979) and Tversky and Kahneman (1981), we predicted that the negatively framed negotiators would demand a premium for foregoing arbitration and reaching negotiated agreements. They would require a larger share of the objective "pie" be contained in a contract for it to be acceptable to them than would positively framed individuals. The confidence manipulations were verified by the probability assessments reported for the likelihood that their final offers would be accepted if arbitration were invoked.

RESULTS

Analysis of the effectiveness of the manipulations showed that the predicted acceptable bargaining outcome (the framing manipulation) was significantly greater for the negatively framed condition than for the positively

framed condition: $F_{1,98} = 5.8, p < .02$; \$20,794 (s.d. = 10,415) versus \$16,051 (s.d. = 9,825). Also, the assessments of probability of success (the confidence manipulation check for those subjects who did not reach agreement) were significantly higher for those individuals in the overly confident condition than in the realistically confident condition: $F_{1,37} = 5.8, p < .02$; 68.9 percent (s.d. = 16) versus 57.7 percent (s.d. = 10). When the concessionary rates of these two groups were compared, the realistically confident groups were significantly more concessionary than were those in the overconfident group; $F_{1,98} = 7.7, p < .01$; \$34,680 (s.d. = 5,964) versus \$31,705 (s.d. = 5,306).

An inspection of the correlation matrix (Table 1) of the dependent variables confirmed the predicted relationship among the three variables reflecting concessionary processes—level of competitiveness (COMPETE) (scored in the reverse), concession rate (CONCEDE), and the number of issues resolved during the bargaining session (NRSLVD)—and the three variables representing successful outcomes—resolution (RESLN), value of the contract (CONTRACT), and perceived fairness of the contract (FAIRCNT).

TABLE 1
Correlation Matrix of All Variables

		2	3	4	5	6	7	8
1. FRAME	1.0							
2. TRAIN	-.400	1.0						
3. COMPETE	-.292	-.153	1.0					
4. CONCEDE	.196	.258	.270	1.0				
5. NRSLVD	.280	.206	-.744	.839	1.0			
6. RESLN	.295	.177	-.769	.771	.900	1.0		
7. CONTRACT	.407	.157	-.461	.553	.600	.563	1.0	
8. FAIRCNT	.317	.045	-.452	.501	.531	.528	.490	1.0

FRAME = Independent variable of framing (positive or negative).

TRAIN = Independent variable of level of confidence.

COMPETE = Dependent variable of perceived level of competitiveness (reverse-scored).

CONCEDE = Dependent variable of concessionary processes.

NRSLVD = Dependent variable of number of issues resolved during negotiation session.

RESLN = Dependent variable of bargaining outcome (impasse or resolution).

CONTRACT = Dependent variable of value of the contract.

FAIRCNT = Dependent variable of perceived fairness of the final contract.

Measures for concessionary processes and successful outcomes were therefore derived by standardizing each process and outcome indicator (with a mean of 0 and a standard deviation of 1) and then adding the three standard scores for each construct together. Subsequent analyses were conducted on the two resulting dependent variables.

Two-way analyses of variance (ANOVA) yielded no significant interaction effects. Further, the ANOVA results showed there were no significant differences in the dependent variables as a function of sex of subject or particular confederate ($p < .70$ and $p < .40$, respectively). The means and standard deviations for the dependent variables are presented in Table 2. For

further clarification, the means of the original dependent variables are presented in Table 3. In general, this table illustrates that the components of both the process and outcome constructs are all in the predicted direction; that is, amount of concession, number of issues resolved, value of the final contract, perceived fairness of the contract, and percentage of negotiated agreements were all greater under the positively framed and realistically confident conditions. Further, as predicted, the perceived level of competition was greater under the negatively framed and overconfident conditions.

Frame

ANOVA results showed that the frame of the negotiation significantly affected the negotiation process: $F_{1,97} = 8.7$; $p < .004$; $\omega^2 = .068$; $-.755$ (s.d. = 2.8) versus $.786$ (s.d. = 2.3). That is, negotiators who viewed the situation from a negative frame, in terms of what they stood to lose, showed little concessionary behavior. The analysis of successful outcomes suggested that the frames of management negotiators significantly influenced outcomes in the predicted direction: $F_{1,97} = 20.5$, $p < .0001$; $\omega^2 = .159$; -1.0 (s.d. = 2.6) versus 1.1 (s.d. = 1.7). Thus, positively framed negotiators had more successful outcomes than did negatively framed negotiators. In both analyses, only a small portion of the variance was accounted for.

TABLE 2
Means and Standard Deviations of Standardized Dependent Variables

		Negative Frame		Positive Frame	
		Means	s.d.	Means	s.d.
Realistically confident	Concessionary processes	0.09	2.38	1.24	1.64
	Successful outcomes	-0.45	2.66	1.32	1.39
Overly confident	Concessionary processes	-1.62	3.20	0.37	2.90
	Successful outcomes	-1.56	2.68	0.79	1.95

TABLE 3
Means of Unstandardized Dependent Variables

		Process			Outcomes		
Frame ^a	Level of Confidence ^b	Con- cessionary Processes	Number Resolved	Com- petitiveness	Resolution	Value of Contract	Perceived Fairness
N	O	\$30,180	3.28	15.96	36.0%	\$ 200	24.3
N	R	33,903	4.08	13.42	61.5%	\$1,404	25.4
P	O	33,231	4.27	12.00	73.1%	\$2,981	28.2
P	R	35,456	4.65	10.96	82.6%	\$4,043	28.6

^aN = negative, P = positive

^bO = overconfident, R = realistically

Confidence

ANOVA results showed that the training of negotiators about the tendency towards overconfidence significantly influenced the process of negotiation: $F_{1,97} = 6.3, p < .01; \omega^2 = .046$. That is, individuals who were overly confident in their judgments showed less concessionary behavior in the negotiation process than did realistically confident negotiators; the respective means were $-.614$ (s.d. = 3.00) versus $.644$ (s.d. = 1.95). Further, the realistically confident negotiators (those who received training) were able to obtain outcomes that were superior to those of individuals who were overconfident: $F_{1,97} = 3.4, p < .07; \omega^2 = .019$; the respective means were $.433$ (s.d. = 2.22) versus $-.387$ (s.d. = 2.37). In both analyses, only a small portion of the variance was accounted for.

DISCUSSION

The purpose of this experiment was to identify systematic ways in which negotiators' judgments affect both the process and outcome of contract negotiations. The results showed that both the frame of negotiation and the level of confidence with which negotiators evaluate bargaining situations are instrumental in shaping both the outcome and the process of bargaining. Thus, both a negotiator's frame and level of confidence exert significant influence on whether or not the negotiator will choose the risky option of arbitration rather than accepting the certainty of a negotiated settlement. It should be noted, however, that the frames of negotiators and their levels of confidence accounted for only a small percentage of the variance. Thus, although these judgmental biases have a significant impact on negotiator behavior, obviously more is going on in the negotiation interaction than can be explained by these two variables.

Given these results and Kahneman and Tversky's (1979; Tversky & Kahneman, 1981) prospect theory, we suggest that individuals are more likely to choose a certain outcome — the negotiated settlement — when evaluating the prospects of perceived gains. But when individuals evaluate the prospect of losses, they behave in a more risk-seeking manner—they are more likely to choose the risky option of arbitration rather than to take what appears to be a certain loss. This finding is especially interesting considering that their invoking arbitration resulted in our subjects' obtaining less successful outcomes than were obtained by those reaching negotiated settlements. It appears that if individuals view potential outcomes in terms of what they have to lose, both parties become risk-seekers, impasse is likely to be declared, and arbitration invoked. Conversely, if individuals evaluate potential outcomes in terms of gains, they behave in a risk-averse manner and are more likely to reach a negotiated settlement.

The second variable that we found explained differences in resolution behavior was the level of confidence negotiators have in the likelihood of the arbitrator choosing their offers in final offer arbitration. We found that the

confidence training exerted considerable influence on how negotiators bargained as well as on the likelihood of a negotiated outcome. If negotiators were overconfident, this overconfidence was reflected in their overestimating the expected value of the uncertain outcome — the arbitrated contract. Overestimating the value of the uncertain outcomes may be sufficient to cause risk-averse negotiators to choose the risky option of arbitration because the premium demanded then appears so large as to block agreement. More realistic assessments of their chances of success should and did result in increases in the probability of their choosing negotiated over arbitrated settlements. When negotiators are more realistic in their assessment of success — in the realistically confident condition — the probability of a negotiated outcome increases.

The results support the notion that it is critical for negotiation researchers to consider the effect of negotiators' systematic biases on the developing character of the negotiation process. These findings may be especially relevant in demonstrating the impact of these systematic biases on the practice of third-party intervention procedures, particularly mediation. If the effects found here are real and prove to be consistent with results from nonstudent samples, this knowledge can be used to augment the efficacy of a third party in successfully encouraging parties to reach a negotiated settlement. This "push" towards a negotiated outcome can improve the process of collective bargaining by returning the responsibility for settlements to the negotiators themselves. However, this study did not collect data that could inform the timing of such interventions by mediators.

Finally, the results of the study have implications for the training of negotiators. Currently, this training seems functionally to be an apprentice arrangement. Because the reliance on decisional biases is not restricted to the uninitiated (Tversky & Kahneman, 1974), the apprenticeship method of training negotiators is unlikely to have a significant impact on reducing their vulnerability to these biases. But if negotiators can be made aware, through specific training, of the systematic ways in which they can and do perceptually alter the negotiation situation, they may be able to use this information to realize significant strategic advantages over less sophisticated opponents. Specifically, if negotiators can be trained to (1) be alert to the systematic biases to which they are vulnerable, (2) differentiate actual, objective gains or losses from the perceptions of gains or losses, and (3) understand and anticipate the effects of opponents' attempts to manipulate the frame of the negotiation, level of confidence, and salience of various costs to the negotiator through attitudinal restructuring (Walton & McKersie, 1965), they may be able to use this knowledge to their particular advantage in the collective bargaining situation.

There are obvious limitations to this study. Particularly salient in this context is the issue of generalizability of these results to other than student populations. In its most conservative interpretation, the results of this study indicate only that an experimenter can manipulate the frame and level of confidence of students negotiating with confederates under a reciprocity

strategy so as to significantly alter both the processes and outcomes of their bargaining behavior. Further, these results say nothing about the impact of framing and overconfidence biases with different negotiating strategies (e.g., hard, soft, or principled strategies).

Although the use of student subjects quickly raises the specter of nongeneralizability of these results, there is some support for the idea that human decision making processes are comparable across different levels of professional training and experience. Einhorn and Hogarth (1978) suggest that neither professional training nor experience necessarily increase the soundness of professional decisions. Further empirical research into the decision making processes of experienced versus inexperienced decision makers has been equivocal with respect to outcomes. Research has shown both that experience with a task improves judgments relative to that task (Christensen-Szalanski & Beach, 1982; Phelps & Shanteau, 1978; Slovic, 1969) and that experience with a task does not improve judgment relative to the task (Bushyhead & Christensen-Szalanski, 1981; Einhorn & Hogarth, 1978). Most research that has identified differences has focused solely on the outcome of judgments and has ignored the cognitive processes involved in arriving at decisions. Because our research emphasizes heuristics that influence cognitive processes, the use of student subjects—who seem to be vulnerable to the same decisional biases as experienced individuals—is, on some levels, justified.

Our findings raise a number of interesting issues that should be addressed in the future. Additional studies should explore the effects of systematic biases on negotiator behaviors and negotiation outcomes. For example, it would be useful to explore the effects of different levels of accountability of negotiators to constituencies on the extent to which negotiations fall prey to these systematic biases. Next, do differences in the way individual negotiators process information—for instance, differences in levels of perspective-taking ability—moderate the intensity of these cognitive biases and reduce the likelihood of reaching negotiated settlements? Other future research could address the issue of generalizability. There are many rich negotiation contexts besides collective bargaining that remain uncharted. Future studies could investigate these other contexts to determine how they are influenced by framing, overconfidence, and other systematic biases. An obvious avenue of exploration, particularly for the framing bias, is the effect on typical buyer/seller transactions of specifying the task as one of minimizing expenses (a negative frame) versus maximizing profit (a positive frame). Thus, there seems to be considerable work to be done within the negotiation context in the identification, prediction, and removal of systematic biases that influence individuals' abilities to make effective decisions.

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THE IMPACT OF PARTICIPATION ON GOAL ACCEPTANCE AND PERFORMANCE: A TWO-STEP MODEL

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Past research has tested goal setting strategies and found high and invariant levels of goal acceptance. The present research consisted of two studies—one laboratory and one field experiment—hypothesizing a two-step model (participation $\xrightarrow{1}$ acceptance $\xrightarrow{2}$ performance) with which participation could be tested more effectively. Stepwise, hierarchical regression analyses demonstrated that the participative and representative groups outperformed the assigned groups under conditions in which individual goal acceptance varied. The findings support the two-step model and offer an explanation as to why previous research has failed to differentiate empirically between participative and assigned goal setting.

The basic assumption of a goal setting model of behavior is that goals are immediate regulators of human behavior. A goal in this context is what the individual is trying to accomplish (Locke, Shaw, Saari, & Latham, 1981). The major finding supporting this theoretical model is that specific and difficult goals lead to high levels of performance if these goals are accepted by individuals (Locke, 1968). Thus, goal setting can be an effective method of influencing performance.

However, goal acceptance cannot be taken for granted. For instance, Beer (1976) described group participation in discussion as a means of creating commitment to organizational goals under conditions of resistance. Willer and Miller (1976) found that mere information about a task and goal without participation resulted in low levels of goal acceptance and poor performance—longer patient stays in a psychiatric hospital. Successfully influencing individuals to accept organizational goals may be the essence of leadership and managerial effectiveness (Coch & French, 1948; Lewin, Lippitt, & White, 1939; Vroom & Yetton, 1973). Thus, goal acceptance is a key issue relating to whether or not goals affect performance (Locke et al., 1981).

One method employed to enhance goal acceptance is participation in decision making (PDM) (Lewin, 1951). This method has been employed in

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industry to overcome resistance to change (Coch & French, 1948) and as a managerial strategy to increase subordinates' goal acceptance (Vroom & Yetton, 1973). Although many researchers advocate its use (Argyris, 1955; Likert, 1961; Tannenbaum, Kovcic, Rosner, Vianello, & Weiser, 1974), few researchers have made clear what PDM entails (Locke & Schweiger, 1979).

Locke and Schweiger proposed that PDM influences productivity indirectly through two mechanisms: cognitive aid (e.g., providing information about the task), and motivational aid (e.g., enhancing acceptance and increasing goal difficulty, perhaps through a social comparisons process). They further specified that PDM influences acceptance, which in turn influences performance. The cognitive benefits of PDM are increased knowledge and understanding of the goal and the task (Lewin, 1951). The motivational benefits of PDM may include increased commitment to the goal (Lawler & Hackman, 1969) and the setting of higher goals (Latham & Saari, 1979; Latham & Yukl, 1975; Zander, 1979).

In a recent paper addressing the theoretical role of acceptance in goal setting, Erez and Kanfer (1983) argued that participation in goal setting may increase goal acceptance beyond externally assigned goals by increasing an individual's feelings of control over the goal setting process (Bandura, 1977; DeCharms, 1968; Kanfer, 1980). Research on assigned and participative goal setting consistently has found no differences in goal acceptance between these two strategies (Dossett, Latham, & Mitchell, 1979; Latham, Mitchell, & Dossett, 1978; Latham & Saari, 1979). An exception was Hannan (1975), who found that PDM enhanced goal acceptance. In addition, Locke et al. (1981) cited several studies that do not support a linear relation between goal acceptance and performance even though goal acceptance is presumably a required part of the goal setting model (Locke et al., 1981).

Thus far, nearly all research studying the effects of goal acceptance on performance has found goal acceptance invariant with respect to participation (Dossett et al., 1979; Latham et al., 1978; Latham & Saari, 1979).

The issue of interest in the present study was to determine whether or not the reviewed relations hold with varying levels of goal acceptance. We investigated whether participative goal setting enhances goal acceptance when individuals are faced with goals perceived as being extremely difficult. In addition, we investigated the relation of goal acceptance to performance under these conditions. The study sought to determine whether goal acceptance and performance are positively related, and whether participative goal setting is a means of enhancing goal acceptance.

We suggest that participative goal setting enhances goal acceptance more than does assigned goal setting when an individual faces a goal perceived as extremely difficult or undesirable. Support for this comes from Coch and French (1948), Hannan (1975), and Lewin (1951). Therefore,

Hypothesis 1: The level of goal acceptance increases as degree of participation increases.

The relation of acceptance to performance is less clear in prior research. Researchers have failed to find a consistent relation between these two

variables despite their intuitive connection (Locke et al., 1981). The strong theoretical basis provided by Erez and Kanfer (1983), however, would suggest a positive relation. Specifically,

Hypothesis 2: Participation influences performance through its influence on acceptance.

STUDY 1

Methods

Subjects. The study used 120 male and female students recruited from introductory psychology classes at the University of Illinois. Participants received credit toward their fulfillment of a class requirement.

Design. The experimental manipulation was a 3×2 factorial design consisting of three conditions of goal setting—participative, representative, and assigned; and two conditions of personal goals—one in which the subjects were not asked to set their own personal goals (No-Set), and one in which they were asked to set their personal goals before the goal setting manipulation (Set).

The three goal setting conditions represent three different types of goal setting. In participative goal setting, subjects were allowed to jointly determine their goals. In the representative condition, a representative elected by the group negotiated with the experimenter in setting a goal. This condition was introduced to simulate worker representation as it is found in unions. Finally, in the assigned condition, subjects were assigned a goal equal to an average of those set in the other two conditions during two successive trials in a pilot study.

Task. The subjects were asked to work on a simulated scheduling task. They were given eight courses with at least ten different time and course offerings and asked to assemble as many nonconflicting and nonredundant course schedules as possible using any five of the eight courses. In order to increase external validity, the directions stated that the data were to be made available to the registrar's office staff. The task also enabled the researchers to set or encourage the setting of goals that appeared extremely difficult, but were actually not unreasonably difficult. (During a ten minute practice trial, the subjects were able to construct only two or three schedules. However, the task became much easier with practice).

Manipulations of goal-setting conditions. Performance goals were set for each experimental condition by the following manipulations:

(a) In the assigned condition, subjects were assigned a goal based on results from a pilot study using the participative and delegative manipulations for two successive twenty-minute trials. These assigned goals—10 and 25 schedules per person for phases 1 and 2, respectively—were achieved by 10% of the pilot subjects after two trials of 20 minutes each. The subjects were told, "Your goal is difficult, but our pilot research indicated that others have attained a goal of 10 (25) schedules." No other information was made available to them except the time limits of phases 1 and 2.

(b) Each representative group elected an individual to negotiate with the experimenter in setting the goal for each member of their group. Because group members lacked specific information about each other, the experiments suggested to them it would be wise to elect as representative the member with the most coursework completed or the greatest amount of summer or full-time work experience. The negotiator initially told the representative that they would barter for the group's goal. The negotiator attempted to match the goal in the representative condition to the one set for the assigned goal condition. Specifically, the negotiator asked the representatives, "How many schedules can your group produce per person? Our pilot research has indicated others can attain 10 (25) schedules." Next, the negotiator made a counter-offer equal to the assigned goal plus the difference between the representative's offer and the assigned goal—e.g., a representative offered eight, the assigned goal was 10, the negotiator's counter-offer was 12, and the negotiation settled on the middle point of 10.

(c) Each participative group was asked, "Please make a group decision for the goal each individual in your group will pursue in the first phase of the experiment. Our pilot research has indicated others can attain 10 (25) schedules." Specifically, the experimenter told the group that pilot research had indicated that others had attained a goal of X (where X = the number given in the assigned condition), and that their goals should be "... difficult, but realistic and obtainable."

By providing equivalent information concerning performance norms to the subjects in all the conditions, possible confounding effects from competition were held constant. No other information was provided to any of the conditions. Actual goals set by the representatives and groups ranged from 9 to 11 in phase 1 and from 24 to 26 (with one exception) in phase 2. Thus, goal difficulty was not significantly different ($F_{2,113} = .48$, n.s.) across goal-setting conditions.

Also, the experimenters relied upon standardized scripts to help ensure the goal-setting climate was consistent across strategies. In the group discussion, for instance, the experimenter merely gave the norm data from the pilot study and said that, goals should be "... difficult, but realistic and obtainable." The interpersonal style employed by the experimenter was the same as for the other conditions. Under no circumstances was any other information provided. In addition, the experimenters were blind to the hypothesis and were rotated across the various goal setting conditions to randomize experimenter effects.

Setting personal goals—set and no-set conditions. Subjects in the set condition were asked to write down their personal goals before the goal-setting manipulation. In the no-set condition the subjects did not write down their personal goals before the goal setting. Based on a pilot study, personal goals were expected to be far below group goals set in the participative or representative conditions; this discrepancy would be reflected by increased variance of goal acceptance for those individuals publicly committing themselves to some goal (Lewin, 1951). This manipulation may also introduce

goal conflict, thereby reducing acceptance of the externally set goal (Stedry, 1960).

Goal acceptance measures. A questionnaire determining the degree of goal acceptance was administered to subjects. Two items were used: the traditional form ("To what extent do you accept the goal?") replicating much of the previous research on goal setting, and an additional question with a minor variation in wording (changing "To what extent . . ." to "Do you really accept the goal that has been set?")

Procedure. Each subject was randomly assigned to one of six experimental conditions (assigned, delegative, and participative goal-setting crossed with set and no-set personal-goal conditions). The 20 subjects in each of the conditions were further divided into four parallel groups to keep group sizes manageable. All subjects were given a ten-minute practice trial to familiarize themselves with the task. Next, phase 1 began when subjects in the set condition were asked to write down their personal goals for the number of schedules to be correctly assembled within the following 20 minutes. (At this point, the subjects had only the practice trial on which to base their judgments). The performance goals for the subjects were then determined according to each group's respective goal-setting strategy—participative, representative or assigned. Subjects in the set condition were told to pursue their groups' strategy-determined goal rather than their personal goal. Subjects completed the individual acceptance questionnaire prior to beginning the 20-minute scheduling task, then worked for 20 minutes. The total time of this phase was 40 minutes. After completion of phase 1, all subjects were asked to repeat the entire process for phase 2. The purpose of phase 2 was two-fold: (a) increase the variance of individual acceptance by increasing goal difficulty from 10 to 25 schedules, and (b) provide an indirect check on the reliability and validity of the acceptance measure through response patterns of the subjects.

Upon completion of phase 2, a questionnaire was administered to the subjects to determine post-experiment commitment to the goal, opinions about the experiment's characteristics, and personal data; this was followed by debriefing.

Manipulation checks. (a) Participation: As a manipulation check, the participation effect was measured by two questions about the perceived influence the subjects had in goal-setting, and their perceived influence relative to the experimenters. Responses were rated on a 5-point Likert-type scale ranging between 1 (no influence) to 5 (complete control). Results demonstrated significant differences on a summed score for the acceptance items between the participative, representative, and assigned goal-setting conditions ($F_{2,113} = 4.03$, $p < .05$). The highest mean influence score on both questions was in the participative condition, and the lowest was in the assigned condition ($\bar{x}_{\text{part}} = 2.98$, $\bar{x}_{\text{rep}} = 2.48$, $\bar{x}_{\text{assign}} = 2.20$). Paired comparisons demonstrated that perceived influence was significantly different across the three conditions ($t = 7.23$, $p < .01$ for participative vs. representative; $t = 5.61$, $p < .01$ for representative vs. assigned).

(b) Goal Acceptance: Acceptance was measured by subjects' responses to the two forms of individual goal acceptance. Since these two items were highly correlated ($r = .83, p < .01$), they were summed for subsequent analyses. Goal acceptance was significantly higher in the no-set than the set condition across the three goal-setting conditions (phase 1: $\bar{x}_{ns} = 5.85, \bar{x}_s = 4.75, p < .05$; phase 2: $\bar{x}_{ns} = 4.77, \bar{x}_s = 3.40, p < .05$). The same response pattern repeats itself in both phases, supporting the psychometric strength of the acceptance measure. The responses to these items were correlated across phases 1 and 2 ($r_{ns} = .53, r_s = .63, p < .01$). In addition, the final questionnaire contained a question on subjects' commitment to their goal. Responses to this question are expected to be consistent with the goal acceptance measure. The mean commitment scores for the no-set and set conditions were 2.95 and 1.77, respectively, and were significantly different ($t = 3.83, p < .01$). The responses to the commitment measure were significantly correlated with the acceptance measure ($r_{ns} = .71, r_s = .85, p < .01$).

Results

Goal acceptance. Table 1 summarizes the means and standard deviations of individual goal acceptance in the six experimental conditions. A stepwise, hierarchical regression model was used to test the main effects of goal setting and the personal goal set manipulation upon individual goal acceptance, and to test for the interaction of goal setting with personal goal set manipulation.

TABLE 1
Laboratory Experiment: Means and Standard Deviations
of Individual Goal Acceptance

Goal-Setting Condition	Phase 1				Phase 2			
	Personal Goal Condition				Personal Goal Condition			
	No Set		Set		No Set		Set	
	Means	s.d.	Means	s.d.	Means	s.d.	Means	s.d.
Assigned	4.95	1.60	3.70	2.02	3.50	2.23	1.70	0.92
Representative	5.85	1.53	5.25	1.99	4.50	2.06	3.70	2.25
Participative	6.75	0.55	5.30	1.78	6.30	1.59	4.80	1.96

Variables entered the regression equation in the following order: baseline performance, followed by goal setting condition and personal goal set, followed by the interaction term. The effects were coded for the treatment of categorical variables for a general significance test, as follows: (a) no-set and set condition were coded as 1 and 0, respectively; (b) assigned, representative, and participative goal setting conditions were coded -1, 0, 1, respectively. When a significant effect for goal setting conditions was found ($p < .05$), orthogonal contrasts were set up as follows: D1—comparing the assigned condition with the representative and participative conditions, coded as 2,

-1, -1, respectively; and D2—comparing the assigned and representative conditions with the participative condition, coded as -1, -1, 2, respectively. Findings for the regression analyses with these contrasts are summarized in Table 3(a).

The dummy-coded goal-setting contrast of D1, assignment versus the two other conditions, accounted for 14 percent of the variance in individual acceptance in phase 1 and 20 percent of the variance in phase 2. The personal goal set manipulation significantly increased the explained variance by about the same amount in phases 1 and 2 ($\Delta R^2 = .08$; $\Delta R^2 = .09$). The second contrast of D2, company participation with the two other conditions, was the third variable to enter the regression equation with a significant contribution only in phase 2 ($\Delta R^2 = .07$, $p < .05$). There were no significant interaction effects in either phase. Overall, the goal setting contrasts and personal goal set manipulation explained 24 percent of the variance of goal acceptance in phase 1 and 36 percent of the variance in phase 2. As expected, individual acceptance was the highest for the participative condition and the lowest for the assigned goal condition. The manipulation of personal goal set had a significant effect on the individual level of acceptance; acceptance was higher in the no-set than in the set condition.

A comparison between the two experimental phases indicates that individual goal acceptance significantly decreased ($p < .01$) from phase 1 to phase 2 for the assigned and representative conditions. Yet, individual goal acceptance did not change significantly for the participative groups. Thus, the increase in goal difficulty in the second experimental phase negatively affected goal acceptance in the representative and assigned goal conditions.

Performance. Mean performance scores for the practice trial (baseline) and phases 1 and 2 are presented in Table 2. A one-way analysis of variance (ANOVA) demonstrated a significant difference among the six conditions on the baseline performance ($F_{5,118} = 2.49$, $p < .05$). (The representative groups outperformed the other groups on baseline performance). A stepwise, hierarchical regression analysis was used to remove the effects of the baseline performance from the manipulation effects and to test the effects of goal setting contrasts, personal goal set, and their interaction on performance.

The regression analysis, summarized in Table 3(b), demonstrated that baseline performance significantly explained 24 percent of the variance in phase 1 performance. Personal goal set manipulation, goal setting contrast D1 (assignment vs. the other two conditions), and the interaction of contrast D1 with personal goal set added significantly ($p < .05$) to the explained variance in performance. Overall, the effects of personal goal set, goal setting contrasts, and their interaction explained 17 percent of the variance in phase 1 performance over and above the baseline effect.

The significant effects are as follows: First, performance (controlling for baseline) was significantly higher in the no-set than in the set manipulation of personal goals. Performance in the assigned condition was significantly lower than in the representative and participative conditions (contrast D1).

TABLE 2
Laboratory Experiment: Means and Standard Deviations of Performance

Goal-Setting Condition	Baseline				Phase 1				Phase 2			
	Personal Goal Condition		Set		Personal Goal Condition		Set		Personal Goal Condition		Set	
	No-Set	Means	s.d.	Means	No-Set	Means	s.d.	Means	No-Set	Means	s.d.	Means
Assigned	2.28	1.07	1.15	2.31	9.50	2.82	2.84	9.79	16.79	4.79	16.75	7.44
Representative	3.20	1.47	2.70	3.52	13.90	4.01	5.93	12.10	18.05	5.11	18.84	7.62
Participative	2.80	1.50	1.06	2.41	15.45	5.90	3.82	8.35	22.90	6.84	16.70	8.24

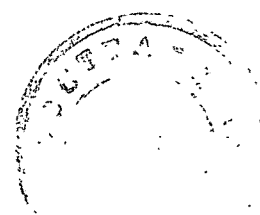


TABLE 3
Regression Results for Performance and Individual Acceptance

Step	Variables	Phase 1			Variables	Phase 2		
		R ²	ΔR ²	F		R ²	ΔR ²	F
(a) Individual Acceptance								
1	Assigned vs. others (D1)	.14	.14	18.79*	Assigned vs. others (D1)	.20	.20	30.36*
2	Personal goal set (PGS)	.22	.08	13.19*	Personal goal set (PGS)	.29	.09	14.34*
3	Participative vs. others (D2)	.24	.02	1.65	Participative vs. others (D2)	.36	.07	11.75*
4	Interaction 1 (D1 × PGS)	.24	.00	.67	Interaction 1 (D1 × PGS)	.36	.00	.79
5	Interaction 2 (D2 × PGS)	.25	.01	.77	Interaction 2 (D2 × PGS)	.36	.00	.68
(b) Performance								
1	Base	.24	.24	33.70*	Base	.12	.12	14.33*
2	Personal goal set (PGS)	.32	.08	13.98*	Participative vs. others (D2)	.14	.02	3.50
3	Assigned vs. others (D1)	.35	.03	5.07*	Personal goal set (PGS)	.16	.02	1.68
4	Participative vs. others (D2)	.35	.00	.12	Interaction 2 (D2 × PGS)	.18	.02	3.57
5	Interaction 1 (D1 × PGS)	.41	.06	9.31*				
6	Interaction 2 (D2 × PGS)	.41	.00	1.22				
(c) Performance								
1	Base	.24	.24	33.70*	Base	.12	.12	14.33*
2	Individual acceptance	.28	.05	7.16*	Individual acceptance	.18	.06	8.60*
3	Personal goal set (PGS)	.34	.06	9.50*	Personal goal set	.18	.00	.23
4	Assigned vs. others (D1)	.36	.02	3.00	Participative vs. others (D2)	.18	.00	.30
5	Participative vs. others (D2)	.36	.00	.02	Assigned vs. others (D1)	.19	.01	.31
6	Interaction 1 (D1 × PGS)	.41	.05	9.50*				
7	Interaction 2 (D2 × PGS)	.42	.01	1.48				

*p < .05

The interaction effect indicates that subjects in the participative and representative conditions outperformed those in the assigned condition only in the no-set goal manipulation.

Phase 2 performance was not affected by the experimental manipulation of goal-setting conditions.

Controlling for individual acceptance. It was hypothesized that differences between the participative and representative conditions and the assigned condition would only be significant when there was variance in individual acceptance. To test this hypothesis, a comparison was made between the goal-setting condition contrasts (D1, D2) with and without removing the effects of individual acceptance. A hierarchical regression model was used to remove the effects of baseline performance and individual acceptance. The results, summarized in Table 3(c), indicate that the goal setting contrasts and setting one's personal goal (phase 2) did not significantly contribute to the explained performance variance when the variance in individual acceptance was removed (see Table 3b). As goal acceptance increased, so did the contributions of the goal-setting strategies to the explained variance in performance.

STUDY 2

A field experiment was conducted to explore whether the results of the laboratory study were generalizable. Neither the representative strategy nor the personal goal set treatment could be used because of the limited size of the field sample. Thus, only the participative and assigned goal-setting conditions were examined. But, the focus of this study was the same — namely, the part played by goal acceptance.

Methods

Subjects. Participants were 20 male and female animal caretakers from the University of Illinois, Laboratory Animal Division. Subjects were required to perform the task as part of their job.

Design. The experimental manipulation consisted of two goal-setting conditions—participative and assigned.

Task. The subjects were asked to design some method of recording animal behavior on a daily basis. This method was adopted as the experimental task. Specifically, the task consisted of a checklist of behavioral symptoms (such as eliminatory behavior and breathing), which the subject would check as being either good, suspect, or bad. One such checklist corresponded to each animal under the worker's care. In addition to behavioral data, the subjects recorded the time and location of the observation along with their initials.

Goal. The experimenter asked the participative group members what the goal should be with regard to the newly devised task—the recording of behavioral observations. After a brief discussion, the groups decided by consensus that their goal should be to observe all the animals they cared for and record

their observations daily. In the case of small animals (e.g., rodents), entire cages should be treated as a single entity.

Manipulations. The participative group jointly determined the task as well as the goal for the task. The same goal and task were assigned to the remaining group ($N = 10$).

Procedure. Subjects were randomly divided into two groups of 10 each — one participative and one assigned group. All subjects were told that some type of animal observations were required by national certifying agencies and that the task was a means of satisfying this requirement. The participative group was then separated from the assigned group and asked to devise a method of animal observation. After this, they were asked to discuss among themselves an appropriate goal with regard to this devised task. The other group was assigned the task and goal on a subsequent occasion. To ensure comparable knowledge of the task across groups, the experimenter carefully explained exactly what the task and goal were. After this briefing, subjects were asked if anyone had questions. When the goals had been set, subjects were asked to indicate their individual goal acceptance on a 7-point scale prior to performance (1 = completely reject; 7 = complete accept).

One obvious source of confounding in the goal setting procedure could be differential supportiveness across conditions. To reduce the chances of this, the experimenter acted only in a reflective capacity during the group discussion. Typical examples of the experimenter's comments include, "Will that (the proposed task) satisfy the federal guidelines?" or "Is that a reasonable but challenging goal for observation?" In the case of the assigned group, the experimenter explained the task, then assigned the goal. The interpersonal style employed in both conditions was one of impartiality and professionalism. To aid this impression, the experimenter was introduced to all the subjects as a university consultant brought in to give recommendations on procedural changes.

Subjects then began the task. They recorded animal behavior daily for two weeks; only the second week's data were analyzed to avoid confounding due to any short-term acquiescence. (The performance patterns obtained in week 1 were the same as week 2—see Table 4.) Data sheets were collected at the end of each five-day work week by a supervisor who was blind to the experimental conditions. At the end of week 1, group members were told in a staff meeting their levels of performance during that week. After completion of the second week of data collection, subjects received the post-experiment questionnaire employed in study 1 and were then debriefed as to the nature of the study.

Results

Data analyses tested for the effects of the experimental manipulations on performance and goal acceptance.

Acceptance. Results of a one-way ANOVA showed that the participative group was significantly higher than the assigned group on goal acceptance ($\bar{x}_{\text{part}} = 6.50$, $\bar{x}_{\text{assign}} = 4.20$; $F_{1,18} = 23.69$, $p < .05$). The goal setting variable

accounted for more than 50 percent of the variance between groups ($\eta^2 = .56$). In addition, pre- and post-performance acceptance measures were highly correlated ($r = .83, p < .01$) within conditions.

Performance. Performance scores were converted to ratios by dividing each subject's output by the predetermined goal. This procedure was used because workers did not have the same number and type of animals, but did have goals of comparable difficulty. Thus, the ratios represent performance relative to the goal of the individual. Mean performance scores are presented in Table 4 for days 1 to 5 and for all five days in weeks 1 and 2.

A series of one-way ANOVAs were conducted to determine whether the two strategies were significantly different across the five data periods of the second week and the average of all five. Results presented in Table 5 demonstrate that the participative group outperformed the assigned group in all the periods except the first day.

A stepwise, hierarchical regression performed on the summed data with the goal-setting condition coded as a dummy variable demonstrated that when variance due to individual acceptance was removed, the goal-setting manipulation (participative vs. assigned) did not significantly increase the explained variance ($R^2 = .47$) in performance ($\Delta R^2 = .08, n.s.$).

TABLE 5
Results of One-Way Analyses of Variance of Performance
by Goal-Setting Condition

Day	Source	SS	df	MS	F	η^2
1	Condition	31.50	1	31.50	3.71	.17
	Error	152.92	18	8.49		
2	Condition	104.88	1	104.88	8.97*	.33
	Error	210.44	18	11.69		
3	Condition	80.00	1	80.00	6.00*	.25
	Error	240.00	18	13.33		
4	Condition	63.36	1	63.36	7.39*	.29
	Error	154.38	18	8.58		
5	Condition	56.11	1	56.11	6.80*	.27
	Error	148.52	18	8.25		
Average condition		64.80	1	64.80	17.55*	.49
Average error		66.45	18	3.69		

* $p < .05$

TABLE 6
Results of Stepwise Regression of 5-day Average Performance
on Individual Goal Acceptance and Goal-Setting Condition

Step	Variables	R^2	ΔR^2	F
1	Individual goal acceptance	.47	.47	15.89*
2	Goal-setting condition ^a	.55	.08	3.04

^aAssigned = 0; participative = 1.

* $p < .05$

Conclusions

The purpose of study 2 was to examine the potential of generalizing from the results presented in study 1. The findings of study 2 demonstrated that participative goal setting resulted in higher goal acceptance than did goal assignment, and that performance of the participative groups were significantly higher than the assigned groups only when individual goal acceptance varied.

DISCUSSION

The hypotheses were partially supported. Participative and representative goal setting significantly increased individual goal acceptance, and individual goal acceptance significantly contributed to performance. Participative and representative goal-setting groups did not significantly outperform assigned goal-setting groups when the variance in acceptance was removed (except for the interaction between personal goal set and the D1 contrast — a result similar to that obtained by Hannan, 1975). These findings may explain why differences between participation and nonparticipation are not significant in studies with no variance in acceptance (Latham & Saari, 1979).

Goal acceptance was originally discussed by Locke (1968) in relation to participation, but unfortunately the direction taken by the vast majority of research in goal setting was to test the relationship between participation and performance (Locke et. al., 1981) without considering acceptance. In fact, a post hoc analysis revealed that acceptance measured after phases 1 and 2 was significantly correlated with performance ($r = .73$, $p < .01$).

The present study obtained variance in acceptance two ways. First, subjects were given or were encouraged to set a goal that appeared extremely difficult to attain; nevertheless, approximately 10 percent of the subjects in all the conditions were able to achieve their goals. When workers are presented a new task, they may perceive an associated goal as being too difficult until after the task is attempted. Tasks for which strong learning effects make initial goals seem unreasonable, or a task that is unfamiliar, may be rejected. Participative goal setting may be one way to increase goal acceptance on such tasks.

An additional manipulation, setting personal goals, demonstrated that we can also increase the variance in goal acceptance when subjects are provided formal, public, written opportunities to set their personal goals prior to externally set goals. The inconsistencies between the personally and the externally set goals were found to decrease goal acceptance. The mean goals for the set condition were 7.81 and 11.61, respectively, for trials 1 and 2, whereas the mean goals for the no-set condition were 10 and 25, respectively. Individual goal acceptance was significantly lower under the set than the no-set conditions ($p < .05$) in phases 1 and 2 of the lab experiment. The drop in acceptance when personal goals were set may very well be due to the public commitment of writing down one's personal goal. The personal goal was always discrepant with the group-set or assigned goal; this is how variance in acceptance was induced. Even lower levels of goal acceptance

occurred when subjects were asked to write down their goals. Lewin (1951) pointed out that public commitment can lead to goal internalization. The subjects in the set condition committed themselves to a personal goal publicly only to be manipulated by the goal-setting manipulations to some other goal. It is not surprising that their acceptance was lower than other subjects since they were, in effect, induced to publicly contradict themselves.

Individual goal acceptance was significantly ($p < .05$) affected by the goal-setting conditions: linear positive relations were found between the degree of participation and the level of goal acceptance. The relations were consistent in both the lab and the field experiments. Moreover, the level of individual goal acceptance remained stable across both experimental phases only for the participative group, whereas in the two other conditions goal acceptance significantly decreased ($p < .01$) from phase 1 to 2, probably because of the increase in goal difficulty. It seems that commitment to the participative group goal was stronger than the negative effect on increased goal difficulty of goal acceptance.

We conclude that goal acceptance varies across goals and tasks and that assigned goals are not always highly accepted. The nonsignificant differences in acceptance across various goal-setting conditions found in previous research may be attributed to common characteristics of these experiments: specific and difficult but attainable goals, goals that are perceived as attainable, and a prior compliance with the experimenter's requirements. The present findings also suggest one plausible reason why previous research has failed to find consistent differences between the effectiveness of participative and assigned goal setting: goal acceptance has varied in some studies but not others (see Locke and Schweiger, 1979, for a review of this literature).

Empirical support for the two-stage model was obtained in the field study and in phase 1 of the laboratory experiment. Level of participation was positively ($p < .05$) related to individual goal acceptance, and the latter was positively related ($p < .05$) to performance through its effect on goal acceptance. These relations disappeared when variance in individual acceptance was controlled. The same relational pattern of goal setting, individual acceptance, and performance appeared in phase 2 (see Tables 1 and 2) even though the goal-setting effect was not significant ($p < .05$, see Table 3).

The interaction effect on phase 1 performance of goal-setting condition contrast (D1) by personal goal set shows that the degree of participation was linearly related to performance for the no-set, but not for the set manipulation (see Table 2). It may be explained as an experimental artifact that should have been avoided. In the first phase, the participative group in the set condition set a goal that far exceeded that of the other two groups (14 vs. 10 schedules for the two others). Such a goal might have been too high, perhaps, discouraging subjects and resulting in low performance. In the second phase, the same group set the lowest goal (19 vs. 21 and 25 in the representative and assigned conditions, respectively) to avoid a second failure to reach the goal. Consequently, the participative group in the set condition underproduced, and the expected linear relations between degree of participation and perfor-

mance were not obtained. It is interesting to note that these findings are contrary to those presented by Campion and Lord (1982). These authors found that failure to reach an initial goal has short-term effects of setting new, higher goals so as to compensate for the earlier performance. We can only speculate that our subjects viewed phase 2 as the final part of the experiment — the completion of their participation in the study. If this is true, our findings would agree with Campion and Lord concerning the influence of initial failures on long-term goals (long-term goals will be lowered although short-term goals will be raised).

This pattern, however, was not found for the acceptance measure. Conflict (set vs. no-set) did not alter the response patterns from phase 1 to phase 2, indicating that acceptance is not the sole determinant of performance. Other unspecified factors may have interfered with subjects' performances. These findings do not negate the hypothesized effect of participation upon acceptance and performance, but suggest that other influences affect performance even if a goal is accepted.

How participation in a goal-setting procedure, even via a representative, influences the translation of goals into performance can only be speculated about at this time. One likely possibility is the perceived control an individual has over the goal (Bandura, 1977; Erez & Kanfer, 1983; Kanfer, 1980). If one participates in establishing a goal, then the perceived control over the goal may be considerably higher than when goals are externally assigned. Consequently, the internalization of the goal and influence on behavioral intentions and behavior may be enhanced in the former compared to the latter condition.

To summarize, this study showed that as goal acceptance increases, the influence of goal setting upon performance also increases. Participation in goal setting seems to be an effective strategy to enhance goal acceptance when individuals are presented a goal that they initially reject because they perceived it as being unreasonable or too difficult. Participation affects performance through its effect on goal acceptance.

Future research should focus on other factors that influence performance and goal acceptance, should examine variance in acceptance of goals, and should investigate how participation affects goal acceptance and subsequent performance.

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PROJECT PERFORMANCE AND THE LOCUS OF INFLUENCE IN THE R&D MATRIX

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This study examines the relationship between project performance and the relative influence of project and functional managers in 86 R&D teams in nine technology-based organizations. Performance relationships are investigated for three areas of influence within the project team and for influence in the overall organizations. Analyses show higher project performance when influence over salaries and promotions is perceived as balanced between project and functional managers. Performance reaches its highest level, however, when organizational influence is centered in the project manager and influence over technical details of the work is centered in the functional manager.

The matrix structure was first developed in research and development organizations in an attempt to capture the benefits and minimize the liabilities of two earlier forms of organization, the functional structure and the project form of organization (Allen, 1977; Kingdon, 1973; Marquis, 1969).

The functional alternative, in which departments are organized around disciplines or technologies, enables engineers to stay in touch more easily with new developments in those disciplines or technologies than does the project form. It has, however, the disadvantage of creating separations between technologies, which makes interdisciplinary projects more difficult to coordinate.

The project form of organization overcomes the coordination problem by grouping engineers together on the basis of the problem or project on which they are working, regardless of their disciplines. Although it eases the integration of multidisciplinary efforts, the project structure removes individuals from their disciplinary departments. The detachment involved makes it more difficult for professionals to keep pace with the most recent developments in their underlying disciplines and results in poorer performance on longer-term technical efforts than occurs in functionally grouped organizations. (Marquis & Straight, 1965).

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FORCES INHERENT IN THE MATRIX

The matrix, by creating an integrating force in a program or project office, attempts to overcome the divisions that are inherent in the basic functional structure. In the matrix, project or program managers and their staffs are charged with the responsibility of integrating the efforts of engineers who draw upon a variety of different disciplines and technical specialties in the development of new products or processes (Galbraith, 1973). The managers of functional departments, on the other hand, are responsible for making sure that the organization is aware of the most recent developments in its relevant technologies, thereby insuring the technical integrity of products and processes that the program or project office is attempting to develop.

These disparate responsibilities often lead to conflict between the two arms of the matrix. Project managers are often forced by market needs to assume a shorter range view of the marketing function than functional managers need to have (Lawrence & Lorsch, 1967). Since they are responsible for developing a product that can be successfully produced and marketed, project managers take on a perspective that is sometimes more closely aligned to that of persons in marketing or manufacturing than to the perspective held in the research and development organization. Functional department heads, with their closer attachment to underlying technologies, are inclined to take a longer term view and consequently may be more concerned with the organization's capability to use the most up-to-date technologies than with meeting immediate customer needs.

Both of these perspectives are necessary to the survival of the organization. Someone has to be concerned with getting new products out into the market, and someone has to be concerned with maintaining the organization's long-term capability to develop and incorporate technical advancements into future products. Research and development organizations, no matter how they are organized, always have both of these concerns. The matrix structure merely makes them explicit by vesting the two sets of concerns in separate managers.

In formalizing these two distinct lines of managerial influence, the R&D organization is generating "deliberate conflict" between two essential managerial perspectives as a means of balancing these two organizational needs (Cleland, 1968). Project managers whose prime directive is to get the product "out the door" are matched against functional managers who tend to hold back because they can always make the product "a little bit better", given more time and effort (Allen, 1977; Marquis, 1969). When these two opposing forces are properly balanced, the organization should achieve a more nearly optimum balance, both in terms of product completion and technical excellence. Unfortunately, a balanced situation is not easy to achieve. Often one or the other arm of the matrix will dominate, and then, what appears to be a matrix on paper becomes either a project or a functional organization in operation.

These two conflicting forces of a matrix affect R&D project performance principally through their respective influences on the behaviors and attitudes of individual engineers. It is the engineers who perform the actual problem-solving activities that result in new products or processes. How they view the relative power of project and functional managers over their work lives will strongly influence how they respond to the different sets of pressures and priorities confronting them in the performance of their everyday tasks.

In any matrix organization, there are at least three broad areas of decision making in which both project and functional managers are supposed to be involved: (1) technical decisions regarding project work activities and solution strategies; (2) determination of salaries and promotional opportunities; and (3) staffing and organizational assignments of engineers to particular project activities. These are critical areas in which project and functional managers contend for influence, for it is through these supervisory activities that each side of the matrix attempts to motivate and direct each engineer's efforts and performance (Kingdon, 1973). The degree to which each side of the matrix is successful in building its power and influence within the R&D organization will have a strong bearing on the outcomes that emerge from the many interdependent engineering activities (Wilemon & Gemmill, 1971).

Although a great deal has recently been written about matrix organizations (e.g., Hill & White, 1979; Souder, 1979), very little is actually known about the effectiveness of these structures (Knight, 1976). In particular, there has been no research investigating the relationships between project performance and the distribution of power and influence within the organization. Will a balance in power between project and functionally oriented forces result in higher project performance? In an attempt to answer this question, the present study examines the relationships between project performance and the relative dominance of project and functional managers for 86 matrix project teams from nine technology-based organizations.

HYPOTHESES

Details of Project Work

This is the arena in which project and functional interests are most likely to come into direct conflict. The project manager has ultimate responsibility for bringing the new product into being and is, therefore, intimately concerned with the technical approaches used in accomplishing that outcome. However, if the project side of the matrix is allowed to dominate development work, two quite different problems can develop. At one extreme, there is the possibility that sacrifices in technical quality and long-term reliability will be made in order to meet budget, schedule, and immediate market demands (Knight, 1977). At the other extreme, the potential of products is often oversold by making claims that are beyond the organization's current technological capability to deliver.

To guard against these shortcomings, functional managers can be held accountable for the overall integrity of the product's technical content. If the functional side of the matrix becomes overly dominant, however, the danger is that the product will include not only more sophisticated, but also perhaps less proven and riskier technology. The functional manager's desire to be technologically aggressive—to develop and use the most attractive, most advanced technology—must be countered by forces that are more sensitive to the operational environment and more concerned with moving developmental efforts into final physical reality (Mansfield & Wagner, 1975; Utterback, 1974).

To balance the influence of both project and functional managers over technical details is often a difficult task. While an engineer may report to both managers in a formal sense, the degree to which these managers both actively influence the direction or clarification of technical details and solution strategies will vary considerably from project to project, depending on the ability and willingness of the two managers to understand and become involved in the relevant technology and its applications. Nonetheless, project performance should be higher when team members can take both perspectives into account. Accordingly, the following is proposed:

Hypothesis 1: Project performance will be higher in a matrix structure when both project and functional managers are seen to exert equal influence over the detailed technical work of engineers.

Salaries and Promotions

Advocates of matrix organizations (e.g., Davis & Lawrence, 1977; Kingdon, 1973; Sayles, 1976) have long agreed on the importance of achieving balanced influence over salary and promotion decisions. Both Knight (1976) and Goggin (1974) explicitly emphasize that matrix organizations require matching control systems to support their multidimensional structures; otherwise, they would be undermined by reward systems that are based on assumptions of unitary authority. The underlying argument is that when engineers view either their project or their functional managers as having more control over chances for salary increases and promotions, the engineers' behaviors and priorities are more likely to be influenced and directed solely by the side with that control.

This is one of the key issues in what are often described as "paper matrix" situations: management assumes that by drawing overlapping structures and by prescribing areas of mutual responsibility, balance will be achieved among appropriate supporting management systems. In practice, however, one of the two components of the matrix comes to dominate or appears to dominate in key areas such as determination of salaries or of promotions. It is important to stress here that it is the engineer's perception that counts. Unless engineers see both managers as controlling their progress in terms of income and status, there will be a natural tendency for them, particularly in conflict situations, to heed the desires of one manager to the

neglect of the other. The matrix then ceases to function, resulting in a structure that is more likely to resemble either the pure project or the pure functional form of organization despite any "paper" claims to the contrary. We therefore expect that:

Hypothesis 2: Project performance will be higher in a matrix structure when both project and functional managers are seen to exert equal influence over the promotions and rewards of engineers than it will be when one or the other manager is seen as dominating.

Personnel Assignments

Personnel assignments often provide the focus for the priority battles that frequently afflict matrix organizations. With the pressure on them from both management and customers to produce, project managers often find themselves in tight competition for the resources necessary to provide results (Knight, 1977; Steiner & Ryan, 1968). One of the most critical of these resources is technical talent. Each functional department employs engineers of varying technical backgrounds, experiences, and capabilities (Allen & Cohen, 1969). Every project manager learns quickly which engineers are the top performers and naturally wants them assigned to his project. As a result, an intense rivalry develops among project managers, with each attempting to secure the most appropriate and most talented engineers for his project (Cleland & King, 1968). Functional managers, on the other hand, have a different motivation. They have no difficulty finding resources to support their top performers, but they also have to keep the rest of their engineering staff employed. They must therefore allocate or market the services of their less talented engineers to all project groupings.

At this point we must make a distinction between performance at the project level and performance at the level of the entire R&D organization. Organizational performance might be higher when project and functional managers have equal influence over personnel assignments. The performance of a single project, however, will probably be higher when that project's manager has greater influence over personnel assignments, since presumably that project will then obtain the best talent. Since our study is at the project level, and although we realize that high individual project performance may be suboptimal for the entire R&D organization, we expect that:

Hypothesis 3: Project performance will, on the average, be higher when project managers are seen to exert greater influence over personnel assignments to their projects than functional managers.

Organizational Influence

We must consider more than the bases of supervisory influence that exist within a project group. Considerable research has shown that managers of high performing projects are also influential outside their project teams (e.g., Katz & Allen, 1982; Likert, 1967; Pelz, 1952; Steiner & Ryan, 1968).

According to these studies, managers affect the behaviors and motivations of subordinates not only through leadership directed *within* the project group but also through their organizational influence *outside* the project (Katz & Tushman, 1981; Pfeffer & Salancik, 1978). The critical importance of organizational influence on project outcomes has also been confirmed by many studies of technological innovation (e.g., Achilladelis, Jarvis, & Robertson, 1971; Myers & Marquis, 1969). In almost every instance, successful innovation required the strong support of organizationally powerful managers who could provide essential resources, mediate intergroup conflicts, and were positioned to protect the developmental effort from outside sources of interference.

Based on these findings, if engineers see either arm of the matrix as having greater power in the organization at large, their behavior should be affected, particularly in situations of conflict. Engineers want to be on the "winning team" (Kidder, 1981). Perceptions of organizational influence, therefore, will be an important determinant of what actually occurs in a project, for an imbalance would probably result in engineers' paying greater attention and attributing greater importance to the more powerful side of the matrix.

This does not mean that the locus of organizational influence necessarily determines the loci of influence over work, rewards, and assignments. There may be, for example, many instances in which the less organizationally powerful manager exerts greater influence over one of the other dimensions. Such incongruences place engineers in uncomfortable positions, particularly if there is strong disagreement between their two managers. As discussed by Allen (1966), discomfort over technical direction often leads to postponement of critical technical decisions and failure to narrow the scope of technical alternatives, resulting in lower project performance. From an exploratory standpoint, our research examines two important questions involving organizational and project influence. First, is there a strong association between perceived organizational influence and the relative dominance of project and functional managers over the rewards, personnel assignments, and technical work of project engineers? And second, to what extent do these dimensions of organizational and internal dominance interact to affect project performance? Do they independently relate to project performance or do they interact in determining performance?

The basic model (Figure 1) underlying our study, then, is that the loci of power between project and functional managers relate to project performance through their respective effects on the behaviors and efforts of engineers in matrix situations. More specifically, how professionals perceive the distribution of influence between their functional and project managers over the technical details of their project work, over their chances for organizational rewards, and over their assignments to particular project activities will significantly affect their performances on their project teams, as hypothesized. These perceived loci of influence, moreover, may be strongly

related to how engineers in a matrix organization see the relative power of the two managers within the larger organization.

On the other hand, the locus of organizational influence may not be associated with any of these three measures of internal influence; instead, it may be an additional factor that interacts with these measures to affect project performance. Most likely, the locus of organizational influence will interact with a particular measure of internal project influence only when the two influence measures are not strongly interconnected; otherwise, it is more likely that they will covary with project performance.

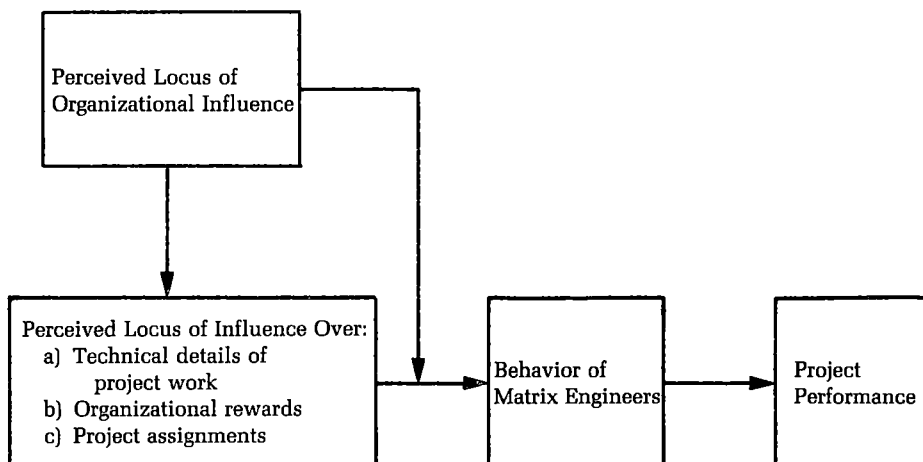
RESEARCH METHODS

Setting

The data presented in this paper derive from a study of R&D project teams in nine major U.S. organizations. Although the selection of participating organizations could not be made random, they were chosen to represent several distinct work sectors and markets. Two of the sites are government laboratories; three are not-for-profit firms receiving most of their funding from government agencies. The four remaining companies are in private industry, two in aerospace, one in electronics, and one in food processing.

In each organization, we first met with higher level managers in order to gain an understanding of how the R&D organization was structured, identify the project assignments of all R&D professionals, and learn the multiple reporting relationships of all project members. Short meetings were then

FIGURE 1
A Model of the Relationships between Project Performance
and Loci of Influence



scheduled with the R&D professionals to explain the broad purposes of our study, to solicit their voluntary cooperation, and to distribute individual questionnaires to all professionals. To insure the accuracy of data on project assignments, we told respondents to answer all questions in terms of the project assignment identified on the questionnaire's front page. If this was incorrect or out of date, the respondent was told to replace it with the correct project assignment. We also tailored questionnaires to the particular reporting structure by using language appropriate to each project group. Project managers, appropriate functional managers, and staff engineers and scientists received slightly different questionnaires; the managers were not asked questions about their own influence or about the influence of their managerial counterparts.

We asked individuals to complete their questionnaires as soon as possible, and gave them stamped, return envelopes so that they could mail completed forms directly to us. (These procedures not only insured voluntary participation, but also enhanced data quality since respondents had to commit their own time and effort.) Response rates across organizations were extremely high, ranging from a low of 82 percent to a high of 96 percent. Data from the nine organizations were collected over a period of 21 months during the 1979 and 1980 calendar years.

Although these procedures yielded over 2000 respondents from 201 project teams, only 86 projects involved engineers and scientists in matrix dual-reporting relationships. A total of 486 engineers worked in matrix relationships in the 86 projects, an average of almost 6 engineers per project. Responses of these engineers, averaged to provide project measures, are the basic data analyzed. The proportion of the project team working in dual-reporting relationships varied from 20 percent (1 project) to 100 percent (18 projects); 19 projects had 70–99 percent, 21 projects had 60–69 percent, 20 projects had 50–59 percent, and 7 projects had 21–49 percent in matrix dual-reporting relationships. Results reported here are based only upon responses of engineers in matrix dual-reporting structures. Since the percentage of matrix engineers within projects varies considerably across the sample, significant findings will be reexamined as a function of these variations.

Matrix Relationships

We asked respondents in matrix structures to indicate on 7-point Likert-type scales the degree to which their project and functional managers influenced: (1) the technical details of their project work; (2) their salary increases and promotions; (3) their having been selected to work on the project; and (4) the overall conduct of the organization. For each of these dimensions of influence, scale responses ranged from 1 for "my project manager dominates" to 7 for "my functional manager dominates"; the middle point, 4, indicated that influence was balanced between the two. For each question, we averaged individual member responses to calculate overall project scores for the four influence areas.

For each measure of influence, we employed a one-way ANOVA to compare within-project variance to between-project variance (cf. Katz & Tushman, 1979) and used Bartlett's *M*-test to examine the homogeneity of intraproject variance. Following these two broad tests, separate *F*-tests insured that the variance of each measure within each project was not significantly greater than the pooled variance. Except for a few isolated instances, the four influence measures for these projects passed all three tests, thereby strongly supporting the procedure of combining individual perceptions to derive aggregated project scores. Results from such statistical methods — as discussed by Oldham (1976), Sheridan and Vredenburg (1978), and others — suggest a very high level of consensus or reliability by project for each of our influence measures, although the reliability of individual responses is certainly limited by the 1-item scales. All of our analyses, however, were conducted at the project level; responses of individual engineers were averaged to provide project measures. Also, project measures reflected only the responses of project engineers in matrix reporting relationships. For each dimension of influence, lower scores were taken to indicate project manager dominance and higher scores to indicate functional manager dominance. Because some questions were not included in early versions of the questionnaire, the number of project teams from which complete data were obtained ranged from 63 to 86.

Project Performance

Since measures of objective performance that are comparable across different technologies have yet to be developed, we used a subjective measure similar to that of many studies, including Lawrence and Lorsch (1967) and Katz and Tushman (1981). In each organization, we measured project performance by interviewing managers who were at least one hierarchical level above the project and functional managers, asking them to indicate on a 5-point Likert-type scale whether a project team was performing above, below, or at the level expected of them, given the particular technical activities on which they were working. Managers evaluated only those projects that they were personally familiar with and knowledgeable about. Evaluations were made independently and submitted confidentially to the investigators. As in the previously mentioned studies, the managers considered — but were not limited to — criteria that included schedule, budget, and cost performance; innovativeness; adaptability; and the ability to cooperate with other areas of the organization. On the average, between four and five managers evaluated each project. The evaluations showed very strong internal consensus within each organization (Spearman-Brown reliabilities range from a low of .74 to a high of .93). It was therefore safe to average the ratings of individual managers to yield reliable project performance scores. However, performance data were missing from two projects. Right after we collected our data, an expert panel of independent, outside R&D professionals exhaustively evaluated a small subset of our project base ($N=8$). The ordering of their project performance evaluations agreed perfectly with the ordering of our

own aggregated measures of performance. Such agreement between two separate sources provides considerable support for the validity of our project performance measures. Finally, our measures of relative project performance were not confounded with size of project groups; they were not significantly related to the overall number of project members, to the number of matrix project members, or to the proportion of project members in matrix reporting relationships. To clarify the distinction between high and low project performance, performance measures were converted to normalized scores, with a mean of 0 (the original sample mean was 3.32).

RESULTS

As previously explained, we averaged responses to classify projects according to the degree to which project or functional managers exerted influence over each of four activity areas. Project scores of 1 through 3 were coded as signifying dominant influence by the project manager, while scores of 5 through 7 were taken to indicate functional manager dominance. Intermediate values, greater than 3 and less than 5, were considered as signifying balanced influence.

The locus of influence, as shown in Table 1, varies considerably both among projects and across dimensions of influence. Influence over technical details of work and over personnel assignments is balanced in the majority of cases. On the other hand, over half of the functional managers are seen as having greater influence over salaries and promotions: functional managers are viewed as controlling these rewards in almost 60 percent of the projects, project managers in only 7 percent. It is important to remember that it is the perceptions of engineers in matrix-reporting relationships that was measured, for it is perceived reality — not the reality itself — that influences engineers' behavior. Project managers may in fact have equal influence over salaries and promotions, but unless this equality is clearly apparent to engineers, it cannot affect their behavior.

Organizational influence, in contrast, is almost equally distributed across the three influence categories, with 30 percent of the projects having a more dominant functional side, 31 percent a more dominant project side, and 38 percent a reasonably balanced situation.

Because the projects under investigation come from government, not-for-profit, and industrial organizations, it is also important to see if there are major differences among these sectors. Generally speaking, there are no significant differences in the distributions of managerial influence for the dimensions of technical content and personnel assignments. In each sector, the distributions are consistent with the percentages reported in Table 1. For the other two loci of influence, however, there are significant variations from the distributions of Table 1 by the type of organization. In the not-for-profit sector, functional managers are seen as having considerably more influence within their organizations than their project management counterparts and are perceived as dominating rewards in over 80 percent of the projects. In

TABLE 1
Distribution of Managerial Influence by Area as
Perceived by Project Members

Area of Influence	Locus of Influence			N ^a
	Functional Manager	Balanced	Project Manager	
Influence within the project				
Technical content of project work	14.0%	50.0%	36.1%	86
Salaries and promotions	58.1	34.9	7.0	86
Personnel assignments	28.6	54.0	17.5	63
Influence within the organization	30.2	38.3	31.4	86

^aAs previously explained, *N* varies by area of influence.

sharp contrast, project managers are viewed as having stronger organizational influence than functional managers in over half of the projects in the industrial and government sectors. These differences are not surprising, since not-for-profit organizations are somewhat more oriented to academic research and probably place greater emphasis on the disciplines than either industry or government organizations; industry and government organizations, in turn, probably put more emphasis on project management and the clear-cut product or system that must be brought into being. We present these descriptive distributions not to test any specific hypothesis, but simply to give the reader a better view of our data base, especially since we could not undertake randomized sampling of organizations. Given these variations, we will investigate the robustness of any significant findings from the whole sample across these different work sectors.

Project Performance

As the above distributions show, it is very clear that the degree to which project or functional managers exert influence over dual reporting engineers differs considerably among projects. The locus of influence also differs for each dimension of influence. The next step, therefore, was to test our hypotheses by seeing how project performance varied with these loci of influence. To examine the proposed relationships, we performed an analysis of covariance on each dimension of internal project influence. In each analysis, project performance was the dependent variable, and the categories of managerial dominance and balance (i.e., the locus of influence) were the independent variables. Since the number of engineers in dual reporting relationships differed substantially among the projects, the number of such engineers within each project was used as a covariate.

Technical details of project work. Table 2 presents results on the relationship between project performance and the locus of influence over the technical details of project work. Performance does not vary significantly with the locus of influence over technical content. Although there is a slight tendency

toward higher performance when the project manager is perceived to have moderately high influence or the functional manager to have strong influence, neither of these tendencies is significant. Also, the latter result stems from only 11 development projects. In any event, balanced involvement in technical matters of both sides of the matrix is not related to higher project performance; the data do not support hypothesis 1.

TABLE 2
Project Performance as a Function of the Locus of Influence over
Technical Content of Project Work

Locus of Influence	Number of Projects	Project Performance ^a
Project manager	31	0.07
Balanced	42	-0.08
Functional manager	11	0.10

^aNormalized means; a one-way analysis of covariance indicated that mean performance did not differ significantly ($F = 1.43$)

Salaries and promotions. In the area of salaries and promotions, the ANCOVA results of Table 3 show that project performance varies significantly across the loci of managerial influence. The mean performance levels in Table 3 indicate that project performance is highest when influence is either balanced or when project managers are viewed as controlling organizational rewards, although there are only six project cases in this latter category. Nevertheless, mean performance is significantly lower when functional managers are seen by project members as having more influence over their salaries and promotion opportunities.

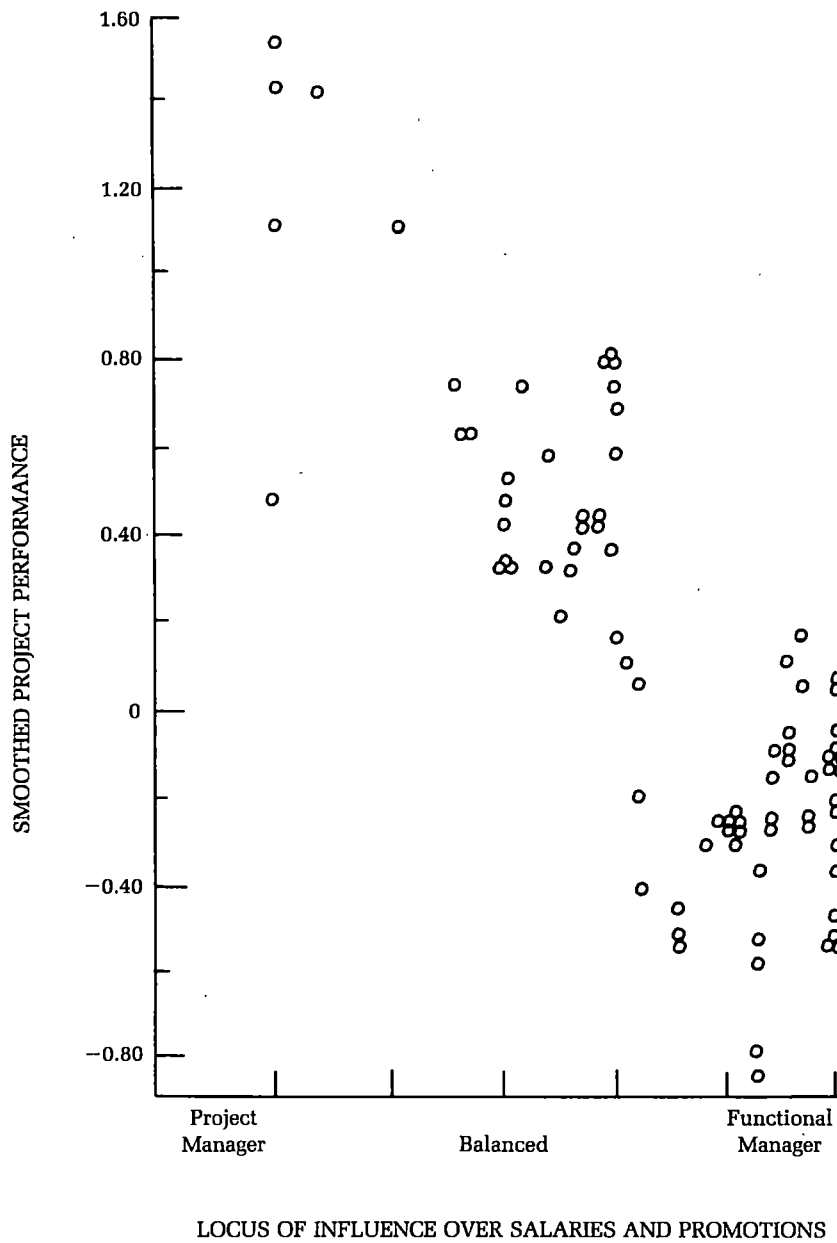
TABLE 3
Project Performance as a Function of the Locus of
Influence over Salaries and Promotions

Locus of Influence	Number of Projects	Project Performance ^a
Project manager	6	0.40
Balanced	29	0.37
Functional manager	49	-0.27

^aNormalized means; one-way analysis of covariance indicated that mean performance differed significantly at the .02 level ($F = 4.69$).

Because the distribution of projects along the influence continuum is so extremely skewed towards functional control, we used Tukey's (1977) smoothing procedures as most appropriate for obtaining a more complete descriptive picture of the association between project performance and the locus of managerial influence over salaries and promotions. An examination of the resulting plot of smoothed performances (Figure 2) reveals a fairly regular

FIGURE 2
Smoothed Project Performance^a as a Function of Locus of Influence over Salaries and Promotions



^aSmoothed by 3 RSSH method used twice (Tukey, 1977)

pattern of decreasing performance with increasing functional control over monetary and career rewards. Although Tukey's smoothing procedures do not yield specific statistical tests, the pattern that emerges from Figure 2, together with the results from Table 3, support the hypothesis that project performance is directly associated with the degree to which project managers are seen as influential over the salaries and promotions of their subordinates.

Personnel assignments. Project performance does not vary significantly with the locus of influence over personnel assignments (Table 4). Although we hypothesized that project performance would be higher when the project manager was seen to have greater influence than the functional manager over the staffing of project work, this does not turn out to be the case—at least not to the extent that its effects are evident in the different project groupings. It is interesting to note, however, that the lowest-performing set of projects are those in which the functional managers are seen as controlling the allocation of project personnel.

TABLE 4
Project Performance as a Function of the Locus of
Influence over Personnel Assignments

Locus of Influence	Number of Projects	Project Performance ^a
Project manager	10	0.04
Balanced	33	0.08
Functional manager	18	-0.41

^aNormalized means; one-way analysis of covariance indicated that mean performance did not differ significantly ($F = 1.07$).

Organizational influence. To what extent is organizational influence associated with the three measures of internal influence within the project? The correlations in Table 5 show that the locus of organizational influence is closely related to the locus of influence over salaries and promotions and to the locus of influence over personnel assignments. The way in which engineers in a matrix structure view the relative power of project and functional managers within the organization is not independent of how they view their managers' relative power over organizational rewards and staffing decisions. The locus of organizational influence is, however, independent of how they see their project and functional managers' influencing the detailed technical content of their work. The correlation between these two areas of influence is close to 0.

Since there is not a strong connection between organizational influence and influence over technical content of the work, the final question is whether the loci of influence in these two areas operate separately on performance or whether they interact to affect project performance. A two-way analysis of variance (Table 6) reveals once again that influence over the technical details

of project work is not related, at least as a main effect, to project performance. The locus of organizational influence, on the other hand, is significantly associated with project performance in that projects with relatively more powerful project managers are somewhat higher performing than are other projects.

More important, however, the ANOVA results also reveal an interaction effect on project performance between these two modes of influence. As shown by the performance means at the top of Table 6, project performance is higher when project managers are seen as having relatively more influence within the organization and functional managers are seen as having relatively more influence over the technical content of what goes into the project. Performance is lowest when functional managers are seen as dominant in both of these areas. Additional analyses did not uncover any interference with these findings by project size or organization sector; nor did they uncover

TABLE 5
Correlation of Locus of Organizational Influence
and Loci of Internal Influence

Internal Influence over:	<i>r</i>
Technical content of work	-.02
Salaries and promotions	.65*
Personnel assignments	.49*

* $p < 0.001$

TABLE 6
Project Performance^a as a Function of the Loci of Influence over Technical
Content of Project Work and Influence in the Organization

Locus of Influence within the Organization	Locus of Influence over Technical Content	
	Project Manager	Functional Manager
Project manager	0.10 (<i>N</i> = 30)	0.80 (<i>N</i> = 12)
Functional manager	-0.05 (<i>N</i> = 30)	-0.59 (<i>N</i> = 12)

Sources of Variation for Two-Way ANOVA:	<i>df</i>	<i>F</i>	<i>p</i>
Influence over technical content	1	0.36	N.S. ^b
Influence in organization	1	4.88	.03
Interaction	1	6.45	.01

^aNormalized means

^bN.S. = not significant

any other significant interaction effects on project performance among the other influence combinations.

As previously discussed, it is important to investigate the robustness of the results from Table 6 since projects varied widely in their percentages of matrix engineers. It is possible, for example, that the relationships between project performance and the distributions of power will be significantly different for projects with high proportions of matrix engineers than for projects in which the proportion of matrix engineers is relatively low. To test this possibility, the sample was divided based on the distribution described in the first part of the methods section. Projects in which at least 70 percent of the engineers were in dual-reporting relationships constituted the high subsample ($n = 37$) while projects with less than 60 percent of engineers in dual-reporting relationships constituted the low subsample ($n = 26$). The 21 intermediate projects were not assigned to either of the subsamples in order to keep a reasonable separation between the categories.

The 2 sets of ANOVA results presented in Table 7 parallel the pattern of means in Table 6. For both the high and low project categories, there is a similar interaction effect on project performance between the two loci of influence. In both subsamples, project performance is highest when project managers are seen as having relatively more influence within the organization and functional managers are seen as having relatively more influence over the technical details of project work; in both instances, project performance is lowest when functional managers are seen as dominant along both of these influence dimensions. These patterns of performance means among the cells are comparable to those in Table 6, suggesting a rather consistent set of results within the overall data base.

DISCUSSION

Our findings suggest an appropriate separation of roles between the managers of R&D professionals in matrix structures. The project manager should be concerned with external relations and activities. He should have sufficient power within the organization to gain the backing and continued support of higher management, to obtain critical resources, and to coordinate and couple project efforts with marketing and manufacturing (cf. Achilladelis et al., 1971). The concern of functional managers, on the other hand, should be more inward-directed, focusing chiefly on the technology that goes into the project. They are usually more closely associated with the necessary technologies, and consequently, should be better able than project managers to make informed decisions concerning technical content.

But these roles can never be completely separate since, for example, relations with marketing and manufacturing have critical implications for technical content, and vice-versa. A strong working relationship must therefore exist between project and functional managers. However, the results of this study suggest that clearer distinction of managerial roles leads to more effective project performance than does managers' sharing responsibilities and

TABLE 7
Project Performance^a as a Function of Locus
of Influence by Proportion of Matrix Engineers

Proportion of Engineers in Matrix Relationships	Locus of Influence within Organization	Locus of Influence over Technical Content	
		Project Manager	Functional Manager
High ($\geq 70\%$) ^b	Project Manager	0.22 (N = 17)	0.89 (N = 6)
	Functional Manager	0.07 (N = 11)	-0.60 (N = 3)
Low (< 59%) ^c	Project Manager	-0.38 (N = 7)	0.80 (N = 4)
	Functional Manager	-0.31 (N = 10)	-0.73 (N = 5)

^aNormalized means

^bBased on a 2-way ANOVA, the main effect for organizational influence and the interaction effect between the two loci of influence for this subsample are significant at the .09 and .06 levels, respectively.

^cFor this subsample, neither of the main effects is significant at the .10 level or less while the interaction effect between them is significant at the .08 level.

involvement. Performance appears to be highest when project managers focus principally on external relations and the output side of the project work, leaving the technological input side to be managed primarily by the functional side of the matrix.

Despite this finding, most of the projects in our sample do not have this role separation pattern, at least as judged by the project members themselves. In more than half of our project groups, for example, members report their project managers have substantially more influence over the technical content of project work than their functional counterparts. Perhaps this is not too surprising since it is the project manager who manages the output and who is ultimately responsible for the project's success. It is, moreover, the project manager's reputation and career that are most intimately tied to project outcomes. Nevertheless, according to our study, overall performance might be improved if functional managers, who know more than project managers about the technologies involved, had greater influence over the technical activities of personnel assigned to project managers.

An enhanced role for the functional manager might also provide some additional benefit in mitigating one of the problems characteristic of matrix organizations. Functional managers have often felt threatened by the introduction of the matrix. Where they formerly had power and visibility in their functional structures, they see, under the matrix, a drift of all of this "glamour" to the project side of the organization. As a result, the matrix has often been undermined by recalcitrant or rebellious department heads, who saw the

technical content of their responsibilities diminishing, and their careers sinking into an abyss of personnel decisions and human relations concerns. A clearer delineation of technical responsibilities and an explicitly defined contributive role for functional managers in the technical content of project work may well alleviate this problem.

Over the years, there has been considerable discussion concerning the need to maintain a balance of power in matrix organizations. Very little has been done, however, to investigate the elements or components of power and influence that should be balanced. Using project performance as our criterion, the present study's results provide very little support for the theories of balanced responsibility. Except for joint influence over the areas of salary and promotion, higher project performance is not associated with a balanced state of influence within any of the other three areas of supervisory activity.

Where does this leave all of the theories and propositions regarding matrix balance? The final set of results in Tables 6 and 7 suggests a better understanding of how balance of power might be achieved to make the matrix more effective. The findings imply that it is *not* through mutual balance or joint responsibilities along single dimensions of influence that the matrix should be made to work, but rather that the matrix should be designed and organized around more explicit role differentiation among dimensions of influence. The project manager's role is distinctly different from that of a functional manager. The two have very different concerns and should relate to both project team members and the larger organization in distinctly different ways. It therefore makes sense that the influence which each should exert over the behaviors of matrix project members to bring about effective project performance will be along different dimensions.

Project performance appears to be higher when project managers are seen as having greater organizational influence. Their is an outward orientation. As a result, they should be concerned with gaining resources and recognition for the project and with linking it to other parts of the business to insure that the project's direction fits the overall business plan of the organization. Functional managers, on the other hand, should be concerned with technical excellence and integrity, seeing that the project's inputs include state-of-the-art technology. Their orientation is inward, focusing on the technical content of the project. Detailed technical decisions should be made by those who are closest to the technology. The localization of technical decision-making in functional departments, however, implies an important integrating role for project managers, who are responsible for making sure that the technical decisions overseen by several different functional managers all fit together to yield the best possible end result. Clearly, the greater project managers' organizational influence, the easier it will be for them to integrate and negotiate with functional managers whose technical goals are often in conflict.

CONCLUSIONS

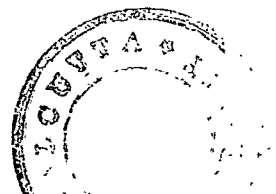
This paper has discussed a few of the factors that might be important in developing a better perspective about matrix structures and relationships. Our findings imply that balanced authority need not exist along each dimension of managerial influence. Instead, the distribution of influence seems better accomplished through differentiation of input- and output-oriented roles to functional and project managers, respectively—although the joint involvement of both managers in the area of organizational rewards was significantly related to higher project performance.

Since the data reported in this study are cross-sectional, we cannot really be sure of what happens to a project team as its members continue to interact throughout the different innovative phases of a project (Roberts & Fusfeld, 1982). For example, the locus of influence that is most effective in the “upstream” or early phases of an innovation process may be very different from what is required as R&D efforts move further “downstream” into the engineering and manufacturing stages. Furthermore, while our discussion has emphasized the direct role that project and functional managers can play in influencing the overall performance of matrix project groups, the reverse situation is just as possible. With higher project performance, for example, project managers may come to be seen as more powerful and influential within an organization. Clearly, it remains for future research to look even more closely at these kinds of relationships.

Even with these caveats, the findings presented here indicate that the distribution of power both within and outside the project group is important in matrix settings. Perhaps it has been the lack of a clear understanding of how to differentiate and integrate the different areas of internal and external influences that has led to so much role conflict, stress, and frustration in the implementation and on-going management of matrix-type designs (e.g., Hill & White, 1979). Although it is relatively easy to create formal matrix structures by establishing two separate lines of reporting relationships, a great deal more research is needed to understand the different staffing requirements and the specific kinds of leadership and management systems necessary to influence and effectively support matrix relationships in R&D organizations. We hope the findings presented here will encourage additional research in these directions.

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A CATASTROPHE MODEL OF EMPLOYEE WITHDRAWAL LEADING TO LOW JOB PERFORMANCE, HIGH ABSENTEEISM, AND JOB TURNOVER DURING THE FIRST YEAR OF EMPLOYMENT

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A catastrophe model of employee withdrawal indicates that declining job performance, absenteeism, and turnover are discontinuous behavioral outcomes of the same withdrawal phenomenon arising from varying levels of job tension and group cohesion. The advantages of using catastrophe models to describe the temporal changes in employee withdrawal over a relatively short time period are discussed.

Catastrophe theory (Thom, 1975; Zeeman, 1976), which offers a mathematical model of dynamic change processes, has been proposed as a useful phenomenological model for describing a variety of discontinuous events in the physical, biological, political, economic and behavioral sciences. Like general systems theory, the model is applicable to a broad class of problems, problems that occur in all sciences in which the researcher is interested in explaining the change from one systems state to another (Guastello, 1982b; Postle, 1980). Recently, catastrophe theory has been used to examine specific operational models of organizational behavior including: contract negotiations between union and management (Oliva, Peters, & Murthy, 1981); employee responses to inequity in organizations (Guastello, 1981); organization responses to change programs (Bigelow, 1982); validation of personnel selection test (Guastello, 1982a); varying production quality between different work shifts (Guastello, 1982b); employee turnover (Sheridan & Abelson, 1983); and the control of employee absenteeism (Guastello, 1984). The objective of this paper is to extend the applications of catastrophe theory to an examination of the dynamics of employee withdrawal during the initial year on a new job.

PREVIOUS RESEARCH ON WITHDRAWAL BEHAVIOR

Bluedorn (1982a) defined withdrawal as a reduction in the employee's sociopsychological attraction to or interest in the work organization. Rice, Hill and Trist (1950) and Herzberg, Mausner, Peterson, and Capwell (1957)

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suggested that increasing withdrawal is related to a corresponding progression of dysfunctional employee behaviors ranging from declining performance, through frequent lateness, to absenteeism, and culminating in voluntary job termination. Empirical research has provided inconclusive evidence of this posited progression of dysfunctional behaviors associated with increasing withdrawal. In general, the relationships between employee performance, lateness, absenteeism, and turnover have been weak and have not always been in the same direction (Adler & Golan, 1981; Bluedorn, 1982a; Clegg, 1983; Martin, Price, & Mueller, 1981; Waters & Roach, 1979; Williams, Livy, Silverstone, & Adams, 1979). Moreover, evidence indicates that these work behaviors are not consistently related to the same affective attitudes, suggesting that the posited withdrawal behaviors may not be varying outcomes of the same withdrawal phenomenon (Arnold & Feldman, 1982; Breauigh, 1981; Cheloha & Farr, 1980; Clegg, 1983; Koch & Rhodes, 1981; Lyons, 1972; Nicholson, Wall, & Lischeron, 1977; Steers & Rhodes, 1978; Waters & Roach, 1979).

There are two important caveats to be noted, however, regarding the previous studies of withdrawal behavior. First, previous research has generally been conducted with heterogeneous cross-sectional samples of all the employees in particular organizations. These samples included employees at different levels of job seniority and at different career stages. Given various economic, social and psychological influences on employee behaviors, it is unlikely that the withdrawal phenomenon leading to their leaving jobs would be the same for employees at all career stages (Krau, 1981); it is likely that the withdrawal phenomenon would occur over a relatively short period of time, not over an employee's total career, if it were to occur at all. Consequently, even statistical controls for job seniority or employee's age in the analyses of heterogeneous samples may not reveal the behavioral responses to withdrawal occurring among employees in a particular age cohort or a cohort of recently hired employees having low seniority in the organization.

A second caveat is that previous research has generally assumed continuous linear relationships between the presumed causes of withdrawal and the employee's behavior. As the sociopsychological determinants of withdrawal increased, it was assumed that job performance continuously declined while the employee's lost work time and propensity to quit continuously increased. Guastello (1981) and Sheridan and Abelson (1983), however, argued that withdrawal to the point of leaving the job may not reflect a continuous linear influence on employee behavior — instead, the presumed causes of withdrawal may be changing slowly and smoothly until the employee reaches some threshold, the crossing of which results in abrupt changes to qualitatively different behaviors. At some levels of withdrawal, the employee, although staying on the job, may show a change in behavior from declining job performance to frequent absenteeism as a result of small changes in the presumed causal variables. At other levels of withdrawal, small changes in

the causal variables may result in a behavior change from staying on the job to leaving it.

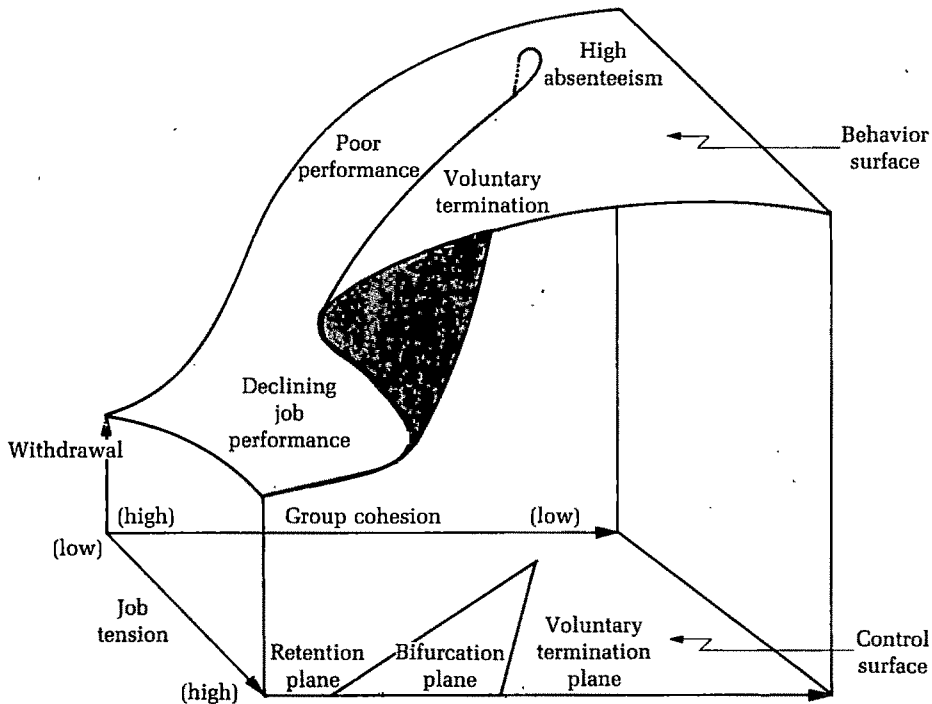
The cusp-catastrophe model provides a useful phenomenological model for examining a dynamic withdrawal process that occurs over time and is posited to result in discontinuous changes in employee behavior. The particular model proposed by Sheridan and Abelson (1983) suggested that the employee's progression through different stages of withdrawal behavior is controlled by two variables. One variable, defined as the splitting factor, represents the employee's perceived tension at work. Job tension represents an "avoidance" influence in that increasing tension may cause the employee to miss work or even quit the job in order to avoid a stressful work environment (Lofquist & Dawis, 1969). The second control variable, defined as the asymmetry factor, represents an "attractor" influence. After an employee has spent an extended socialization period in an organization, the extent to which the employee is committed to the organization's socioeconomic benefits provides a measure of how attractive the job, compared to other possible jobs, is to the individual (Sheridan & Abelson, 1983). However, for employees recently hired by an organization, cohesion among co-workers may represent an important attraction to the job. If group cohesion is strong, the new employee is likely to remain on the job and to manifest withdrawal in declining job performance or frequent absenteeism. At low levels of cohesion, increasing withdrawal would likely result in the employee quitting the job in order to seek a more attractive position.

PROPOSED CUSP-CATASTROPHE MODEL

Figure 1 illustrates a proposed cusp-catastrophe model in which two control factors, job tension and group cohesion, influence withdrawal behavior. The withdrawal behavior surface describes a dense set of time paths that represent the population of individual movements through withdrawal. Each employee follows a particular path over time. Some employees suddenly quit without showing other withdrawal behaviors; others voluntarily terminate their employment after a period of poor performance and/or frequent absenteeism. Yet other employees go through various levels of job performance and absenteeism without leaving their jobs. The temporal changes in withdrawal behavior are characterized by divergence and hysteresis properties (Flay, 1978).

The divergence property, which suggests that as the employee approaches the fold region, even small changes in the control variables result in discontinuous and qualitatively different behaviors, is illustrated by a side cross-section of the fold in the behavior surface. A cross-sectional side view of the fold region indicates that withdrawal represents a parabolic function of the splitting factor, job tension. At any given value of job tension employees may demonstrate different withdrawal behaviors depending on the strength of the asymmetry factor, group cohesion. When job tension is low, those employees attracted by high group cohesion show withdrawal by poor job performance. But, if group cohesion is slightly lower with the same level of job

FIGURE 1
Cusp-Catastrophe Model of Employee Withdrawal



tension, employee withdrawal would result in frequent absenteeism rather than poor performance. In either situation the employee would stay on the job. At high levels of job tension, the employee's deciding to stay or to leave reflects the divergent effects of varying levels of group cohesion.

The trace of the fold in the behavior surface is projected as the bifurcation plane on the control surface. There should be few employees with perceived levels of job tension and group cohesion falling in the bifurcation plane since this region represents a state of disequilibrium where the employee is about to change from one state of withdrawal behavior to another.

The hysteresis property suggests that the behavior transition is asymmetric with respect to changes in group cohesion. Once the employee's time path moves across the fold, even a reversal in group cohesion will not necessarily bring the employee back to the same starting point of behavior. The asymmetry of the transition from retention — staying on the job — to termination — voluntarily leaving the job — is evident. However, the hysteresis property also suggests that, once group cohesion declines to the point where the employee shifts from low job performance to frequent absenteeism, even increases in group cohesion will not immediately cause behavior to revert.

The hysteresis property, which also implies that the observed shifts in withdrawal behavior will vary depending on where the employee's time path crossed the bifurcation plane, is illustrated in the frontal view of the behavior surface. A cross-sectional front view of the behavior surface indicates that withdrawal represents a family of transition functions of the asymmetry factor, group cohesion. At low levels of job tension it is posited that employees remain in the organization and that decreasing group cohesion results in a relatively smooth transition for an employee's demonstrating lower job performance to the employee's demonstrating frequent absenteeism. Bigelow (1982) described this type of smooth transition in the behavior responses of employees as an "evolutionary" change in contrast to the "revolutionary" changes occurring at the front side of the behavior surface. When job tension is high, a corresponding decrease in group cohesion is posited to result in a discontinuous transition from staying to leaving.

Deterministic and Stochastic Models of Withdrawal Behavior

Both deterministic and stochastic models of withdrawal behavior were examined in this study. The deterministic model explains the temporal changes in observed behavior on the withdrawal behavior surface. Thom (1975) and Zeeman (1976) demonstrated that all discontinuous changes in systems' states conform to one of seven elementary catastrophe surfaces. The simplest change is described as a fold-catastrophe model where one control variable causes transitions in a single behavior dimension. In the proposed cusp-catastrophe model, two control variables cause behavior transitions. The topological equation for a cusp-catastrophe surface can be written as:

$$f(W) = W^4/4 - bW^2/2 - aW \quad (1)$$

where W = the dependent withdrawal behavior,
 b = the splitting factor, job tension,
 a = the asymmetry factor, group cohesion.

The withdrawal behavior surface represents the equilibrium position of withdrawal observations such that the first derivative is equal to zero:

$$dW = (W^3 - bW - a) dt = 0. \quad (2)$$

If the time interval (dt) is considered to represent some unit of time, Equation 2 can then be expressed as a regression equation:

$$\Delta W = B_0 + B_1W^3 + B_2(b \times W) + B_3a. \quad (3)$$

Cobb (1981) and Guastello (1982b) indicated that Equation 3 can be written as a more generalized regression equation for the cusp behavioral surface with the addition of the quadratic behavior term (W^2) to control for degeneracy around the fold region and the addition of the splitting factor (b)

to control for a possible skew of the fold region off the bifurcation axis. Adding these two additional terms and defining the asymmetry and splitting factors in Equation 3 result in a general regression equation for explaining discontinuous changes in withdrawal behavior from retention to voluntary job termination:

$$\begin{aligned}\Delta W &= W_2 - W_1, \\ \Delta W &= B_0 + B_1 W_1^3 + B_2 W_1^2 + B_3 (T \times W_1) + B_4 C + B_5 T,\end{aligned}\tag{4}$$

where ΔW = standardized measure of the change in withdrawal behavior between retention at time 1 and either retention at time 2 ($\Delta W = 0$) or voluntary termination at time 2 ($\Delta W = 1$),
 W_1 = current withdrawal behavior at time 1 represented as a standardized score of either current job performance or absenteeism,
 T = standardized score of job tension,
 C = standardized score of group cohesion.

Equation 4 indicates that the change in withdrawal behavior that marks an employee's transition from retention to voluntary termination is explained as a function of job tension, group cohesion, and the employee's current level of withdrawal behavior. Although the precise progression of increasing withdrawal behavior is debatable, it was assumed that more frequent absenteeism reflects a higher level of withdrawal than declining job performance and that voluntarily leaving a job represents the highest level of withdrawal behavior (Bluedorn, 1982a). Consequently, this study includes examinations of two separate deterministic models of the changes in withdrawal behavior (ΔW). Both models attempt to explain the turnover transition: the first by using the employee's job performance as the measure of current withdrawal behavior, the second by using absenteeism as the measure.

The stochastic models (Jobu & Lundgren, 1978; Sheridan & Abelson, 1983), which examine the equilibrium position of withdrawal behaviors on the control surface at a given point in time, attempt to identify two high-density regions of bimodal withdrawal behavior separated by a low-density bifurcation plane. Stochastic models assume that the observed equilibrium pattern of bimodal withdrawal behavior at some point in time resulted from movements in individual time paths across the bifurcation plane during a previous time interval.

METHODS

Population

The population for the present study was composed largely of female nursing employees. In general, nursing employees' propensity to leave jobs declines as job seniority increases (Price & Mueller, 1981; Sloan, 1975). Sheridan and Abelson (1983) indicated that most voluntary terminations on

a nursing staff occur within the first 60 months of an individual's employment in an organization. Others have suggested that turnover among female employees is particularly high during the first 12 months of employment (Koch & Rhodes, 1981). Therefore, the present study sought to examine the behavioral effects of withdrawal within a homogeneous seniority cohort having a high propensity to terminate employment voluntarily. Specifically, the study focused on the withdrawal behavior of new employees during their first year of employment in an organization.

Data for this study were collected as part of a larger research project involving 526 members of the nursing staffs in 25 nursing homes in Florida and Texas. The respondents represent approximately 72 percent of the total nursing staff in these homes. Participating nursing homes, which included both proprietary and nonprofit facilities located in urban and rural areas, all had more than 100 beds and were licensed to provide intermediate and skilled care.

The new employees studied included the cohort of nursing staff members who had been hired within the 6-month period prior to the start of the study. They included 84 employees—7 licensed practical nurses and 77 nurses' aides. At the time of the data collection (time 1), these new employees had been on the job an average of 2.53 months with a standard deviation of 1.38 months. Of the new employees, 96 percent were female, 52 percent were married; 30.4 years was their average age.

For comparison and replication, the catastrophe models also were examined for 271 employees who had worked between 7 and 60 months in the nursing homes at the time of the data collection. As previously indicated, employees in this higher seniority cohort could still be expected to have a high propensity to leave, but changes in their behavior may be less predictable as outcomes of a withdrawal process than changes in the behavior of the newer employees. At the time of the data collection, the employees in the replication group had been on the job an average of 24.8 months with a standard deviation of 12.7 months. Of the more senior employees, 97 percent were female, 67.4 percent were married; 33.3 years was their average age.

Measures

Job tension (T) was measured at time 1. The job tension instrument included 15 scale items proposed by Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964) that measured how frequently (percentage of time) the employee is bothered by various work stressors such as role ambiguity and conflict, work overload, and inadequate resources or skills to perform the job as expected. The tension score was computed as the average frequency of stressful work items ($\alpha = .82$).

Group cohesion (C) was also measured at time 1. The cohesion instrument included six scale items proposed by Kruse and Stogdill (1983) that measure how frequently (percentage of time) the employee feels that co-workers are congenial and cooperate with each other in providing care to all the patients in the nursing home unit ($\alpha = .78$).

The employee's current job performance (*PERF*) at time 1 was evaluated by the immediate supervisor during the month following the completion of the survey instrument. The performance evaluations were made on the Behavioral Anchored Rating Scales (BARS) developed by Sheridan, Fairchild and Kaas (1983), which measures job performance in five performance dimensions including job knowledge and judgment, observation skills, job dependability, cooperation, and interpersonal skills. Sheridan et al. (1983) reported that (1) the BARS measures have high convergent validity among independent evaluations of the same employees, but only marginal discriminant validity among an employee's evaluations on different performance dimensions; and (2) also important for the present study, that there is a high level of agreement among raters using BARS measures as to changes in an employee's job performance ratings over a six-month period. Consequently, even though the new employees had been on the job for only a short time, the BARS measures promised to provide a reliable assessment of an employee's relative job performance at time 1. Total job performance was computed as the cumulative score of the five performance dimensions.

To test the stochastic model of withdrawal behavior, it was necessary to independently establish a bimodal distribution of high and low performance scores. Sheridan et al. (1983) reported percentile norms for the distribution of performance ratings on each dimension of the BARS instrument determined from independent performance evaluations made for a total of 454 nursing employees in ten other nursing homes that were not participants in the present study. The bimodal distribution of job performance measures in the present study was established by designating any new employee with a total performance score above the cumulative seventy-fifth percentile norm on all five dimensions as a high performer and designating any new employee with a total performance score below the cumulative twenty-fifth percentile norm on all five dimensions as a low performer. According to these independent criteria, 17 new employees (20.2%) were low performers and 28 new employees (33.3%) were high performers.

The nursing home administration recorded employees' current absenteeisms for approximately 16 weeks immediately following completion of the survey instruments. To circumvent problems of unstable and skewed measures of lost work time, the frequency of absenteeism was measured rather than total time off the job (Hammer & Landau, 1981). In this study, absenteeism (ABS) is the average number of scheduled work shifts per week that an employee was absent from work during the 16 weeks. If an employee left the job before the end of that period, absenteeism was measured up to the termination date. The average absenteeism rate was .313 incidents per week, comprising .148 incidents of reported sick days and .165 incidents of unexcused absences; incidents of excused absences and time lost because of accidents on or off the job were not included in the measure of the absenteeism rate.

No outside source of population norms of employee absenteeism in nursing homes was available. Therefore, the researcher established a bimodal

distribution of absenteeism rates for the stochastic model from the absenteeism of the remaining 442 employees included in the data collection for the present study who had been on the job for more than six months at the time of the questionnaire survey. The average absenteeism rate for these employees was .164 incidents per week during the measurement period. Of these employees, 37 percent had zero absenteeism during this period; the seventy-fifth percentile among these employees was .20 incidents per week.

Using these criteria, 26 new employees (31%) who had zero absenteeism during the measurement period were classified as having low absenteeism, and 32 new employees (38%) who had absenteeism rates greater than .20 incidents per week were classified as having frequent absenteeism.

Voluntary job terminations were recorded during the six-month period following the completion of the survey. Forty-three new employees (51%) had quit their jobs by the end of the six-month measurement period (time 2); the turnover rate of employees in the replication sample for that six months was 30.2 percent. These high turnover rates are consistent with annual turnover rates ranging from 50 percent to 400 percent for nursing personnel in other areas of the country (Stryker, 1981).

RESULTS

Table 1 shows the intercorrelations among the two control variables and the three withdrawal behaviors measured for new employees in this study. The relationships generally conform to the assumptions of the proposed catastrophe model: The two control variables, job tension and group cohesion, tended to vary independently of each other ($r = -.19$, $p = \text{n.s.}$). The relationships among the withdrawal behaviors were significant ($p < .01$) and in the expected direction. The job performance of the new employees was inversely related to absenteeism and terminations, while absenteeism was positively related to terminations. Both the cubic and quadratic scores of current absenteeism and performance were also significantly correlated with terminations.

TABLE 1
Intercorrelation Matrix for New Employees ($N = 84$)

Variables	2	3	4	5	6	7	8	9
1. Job tension (T)	-.19	-.08	.09	.09	.08	.08	.08	.08
2. Group cohesion (C)		.31**	.30**	.30**	-.11	-.09	-.11	-.25*
3. Job performance (PERF)					-.34**	-.29**	-.25**	-.28**
4. PERF ²					-.35**	-.31**	-.27*	-.27*
5. PERF ³					-.34**	-.31**	-.27*	-.25*
6. Absenteeism (ABS)								.33**
7. ABS ²								.31**
8. ABS ³								.26*
9. Voluntary termination								—

* $p < .05$

** $p < .01$

Table 2 summarizes the test of the deterministic turnover models for both new employees and employees in the replication group. For comparison purposes, the results of a linear interaction model are reported as well as the findings based on catastrophe models (Guastello, 1982a).

TABLE 2
Validity Test for Deterministic Turnover Models

Predictor Variables	New Employees ^a (N = 84)		Replication Group ^b (N = 271)	
	R ²	F ratio ^c	R ²	F ratio ^c
(a) Models using job performance as current withdrawal behavior				
Cusp-catastrophe model:	.129		.132***	
PERF ³		1.51		.00
PERF ²		2.07		.12
TxPERF		.53		3.98**
C		2.35		.00
T		.37		6.55
Linear interaction model:	.126**		.107***	
PERF		2.96*		10.11***
C		2.27		.11
T		.61		.12
CxT		2.01		.13
Post hoc fold catastrophe model:	.098**		.071***	
PERF ²		4.13**		12.41***
C		2.87*		.02
(b) Models using absenteeism as current withdrawal behavior				
Cusp catastrophe model:	.207***		.142***	
ABS ³		5.84**		9.54***
ABS ²		7.22***		8.81***
TxABS		1.38		1.44
C		3.73*		.21
T		.69		11.07***
Linear interaction model:	.172***		.089***	
ABS		7.92***		5.91**
C		1.34		.17
T		1.92		.36
CxT		1.79		.06

^aStaff members with 6 or less months of seniority.

^bStaff members with 7 to 60 months of seniority.

^cF ratios reported are for individual regression coefficients.

*p<.10

**p<.05

***p<.01

The results for the cusp-catastrophe model using job performance as a measure of current withdrawal behavior (Table 2a) explained an insignificant portion of the variance in employee turnover among new employees ($R^2 = .129$). While all terms in the model were significantly correlated with terminations, in Table 1, only the asymmetry factor (C) and the quadratic behavior term ($PERF^2$) have moderate unique effects in the test of the model. The cusp model did not explain any more variance than the linear interaction model, in which only job performance had a significant effect on turnover. These findings suggest that the cusp-catastrophe model may have been inappropriately specified for the transition from declining performance to voluntary termination, which might better fit a fold-catastrophe model, where the change in withdrawal behavior is controlled only by the asymmetry factor of group cohesion. Table 2a also shows a post-hoc analysis of the fold-catastrophe model, which explained a significant portion of turnover variance ($R^2 = .098$). In the fold model, the quadratic performance term was significant while the asymmetry cohesion factor (C) was marginally significant ($p < .10$). These results support the hypothesis that a fold catastrophe model might better fit the transition in question, but, overall, the fold-catastrophe model still explained less variance than the linear interaction model.

The strongest support for the cusp-catastrophe model appeared in the results explaining the transition from absenteeism to voluntary termination (Table 2b). These results explained a significant portion of variance in turnover among new employees ($R^2 = .207$). Both the cubic and quadratic absenteeism terms had significant effects, suggesting a cusp transition, but one with degeneracy occurring around the fold region. The beta coefficients also suggested that terminations were more significantly influenced by variation in the asymmetry factor, cohesion, rather than by variation in the splitting factor, job tension. A linear interaction model, in which only the absenteeism variable had a significant effect on turnover, explained a smaller but still significant portion of turnover variance ($R^2 = .172$) than the cusp model.

The results for the replication group with job performance as the current withdrawal behavior (Table 2a) also failed to support the cusp-catastrophe model. Although the results gave some support for a hypothetical fold-catastrophe model with job performance as the measure of current withdrawal, the fold-catastrophe model again had less predictive validity than a comparative linear-interaction model.

Using absenteeism as the current withdrawal behavior to explain turnover, the analysis for the replication group tends to support the validity of a cusp-catastrophe model (Table 2b). The cusp model explained a significant portion of variance in turnover ($R^2 = .142$) compared to the smaller but still significant variance ($R^2 = .089$) explained by the comparative linear-interaction model. As in the results for new employees, both the cubic and quadratic absenteeism terms were significant, confirming a cusp transition, but one with degeneracy around the fold region. However, whereas the asymmetry effect, cohesion, was marginally significant for new employees,

the splitting factor, job tension, was highly significant in the replication group. This difference suggests that job turnover among the more senior employees is more sensitive to variations in job tension than to variations in group cohesion, but turnover among new employees is more sensitive to variations in group cohesion.

Figure 2 illustrates the stochastic distribution of the turnover observations on the control surface. Stayers (S) and leavers (L) are located at approximate positions for the few instances in which several observations were recorded at the same axis of tension and cohesion. The bifurcation plane was fitted to the turnover observations using Jiobu and Lundgren's (1978) nominal criteria, which are: (1) no more than 30 percent of the total observations should fall within the bifurcation plane and (2) no more than 25 percent of the observations of a particular behavior in the bifurcation plane should cluster together in the same area. These criteria facilitate qualitative judgments that allow visual delineation of the boundary of the bifurcation plane.

The bifurcation plane, a low-density region containing only 8 percent of the total observations (7 employees), represents a disequilibrium position where both staying and quitting were equally probable. The turnover rate among new employees located in the bifurcation plane was 33 percent, compared to the turnover rate of 51 percent for all new employees. The retention plane encompassed a high-density region where employees' staying on the job was highly probable: 46 percent of the new employees (39 individuals) were located in the retention plane, and the turnover rate among these employees was only 18 percent. The termination plane encompassed a region where employees leaving the job was highly probable: 45 percent of the new employees (38 individuals) were located in the termination plane, and the turnover rate among these employees was 89 percent.

Using the binomial distribution for a turnover rate of 51 percent, the probability of finding 34 leavers out of 38 employees in the termination plane was significant ($p < .01$). Likewise, from the binomial distribution, the probability of finding only 7 leavers out of 39 employees in the retention plane was significant ($p < .01$). Therefore, it was unlikely that the disproportionate dispersion of leavers and stayers between the termination and retention planes could represent a chance occurrence.

Overall, the distribution of employees between the retention and termination planes represents a predictive accuracy of 86 percent. There were only seven false negative predictions (9%) for leavers who were located in the retention plane, and there were four false positive predictions (5%) for stayers who were located in the termination plane.

Figure 3 illustrates the distribution of stayers (S) and leavers (L) in the replication group, with the bifurcation plane determined for new employees superimposed on the figure. The results suggest that the new-employee bifurcation plane, illustrated by the dashed-line boundaries, provided a relatively poor fit for the distribution of stayers and leavers in the replication group. Nearly 20 percent of the replication group members fell within the

FIGURE 2
Stochastic Distribution of Stayers (S) and Leavers (L) on the Control Surface ($N = 84$)

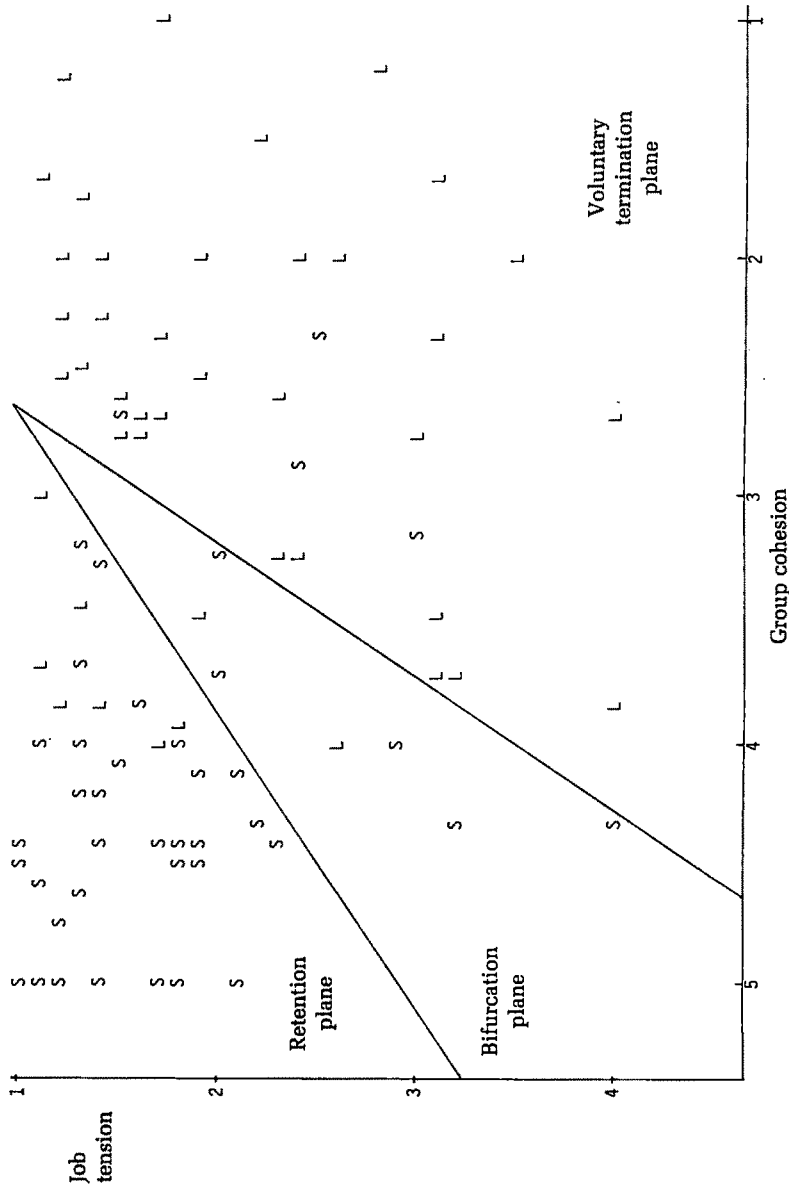
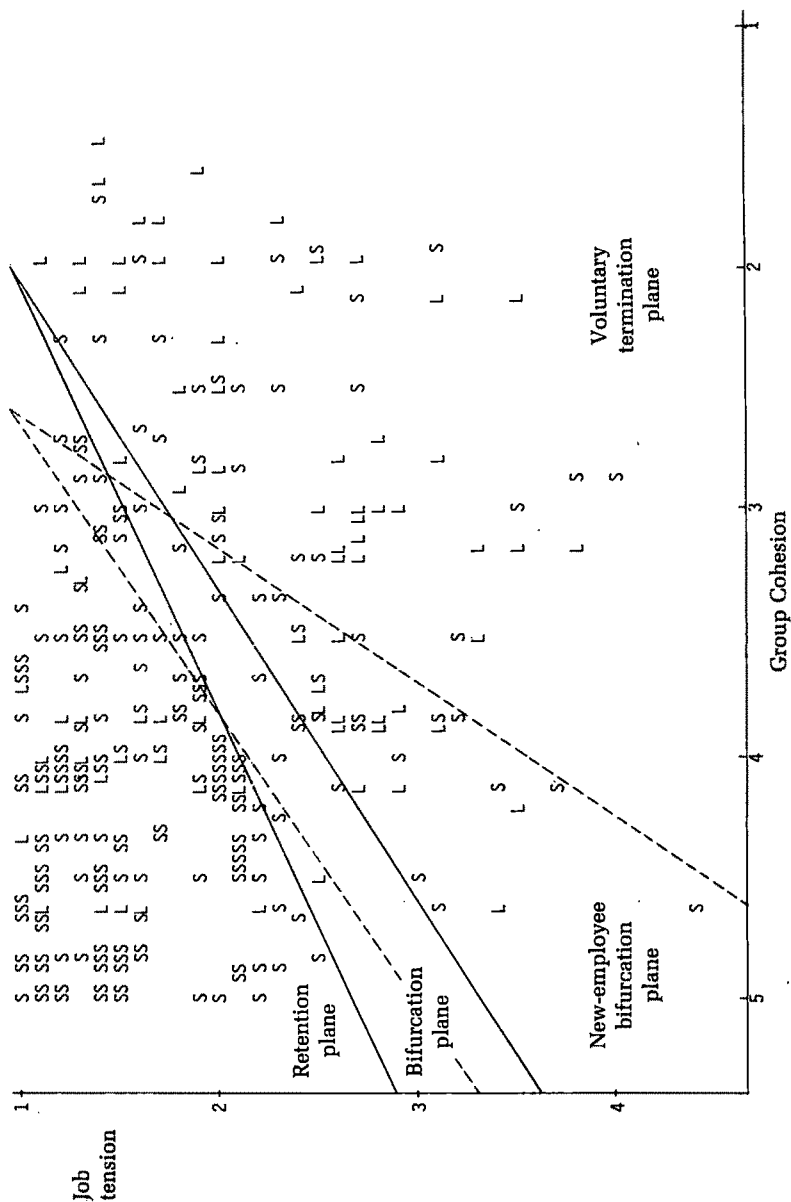


FIGURE 3
Stochastic Distribution of Stayers (S) and Leavers (L) in Replication Group
of Employees with 7 to 60 Months' Seniority ($N = 271$)



new-employee bifurcation plane. The turnover rate among employees falling within this bifurcation plane was 30 percent, but clusters of stayers were also apparent within this plane.

The data in Figure 3 indicate little cross-sample validity for the stochastic model since the new-employee bifurcation plane did not provide a clear demarcation between stayers and leavers in the replication group. It should be noted, however, that the average seniority of employees in the replication group was 24.8 months, compared to only 2.5 months for the new employees. Given this difference between the groups, an average 22.3 months of additional time for adjustment to the work and socialization in the nursing home, it is unlikely that the bifurcation values of group cohesion and job tension would occur at precisely the same boundary points for both new employees and the more senior staff members in the replication group.

An examination of the data in Figure 3 suggests that a relatively narrow bifurcation plane can be fitted among the turnover observations using the nominal criteria proposed by Jobu and Lundgren (1978). This bifurcation plane for the replication group is indicated by the solid-line boundaries in Figure 3. Although less pronounced than for the bifurcation plane observed for new employees in Figure 2, an area of demarcation between stayers and leavers can be observed.

The bifurcation plane for the replication group contained only 13 employees (5%). The retention plane contained 160 employees (59%), who had a 14 percent termination rate. In contrast, the termination plane contained 98 employees (36%), who had a 58 percent termination rate. Using the binomial distribution for a turnover rate of 30 percent in the total replication group, the probability of finding this disproportionate distribution of stayers and leavers in the retention and termination planes is significant ($p < .05$).

Overall, the distribution of employees between the retention and termination planes depicted in Figure 3 represents a predictive accuracy of 75.2 percent. This predictive accuracy for the replication sample was less than the 86 percent reported for the new employees. However, less accuracy could be expected because of the greater range of seniority in the replication group.

Figures 4 and 5 illustrate the stochastic distribution of high (H) and low (L) job performance and frequent (F) and zero (Z) absenteeism among the new employees. The bimodal distributions of job performance scores and absenteeism rates were determined from the independent population norms discussed earlier in the measurement section. The boundary of the bifurcation plane, determined from Figure 2, has been superimposed on the plot of the job performance and absenteeism observations.

Figure 4 shows that 22 of the 28 new employees characterized as high performers (H) were located on the left side of the bifurcation plane, and only 3 high performers were located on the right side of the bifurcation plane. Conversely, 13 of the 17 new employees characterized as low performers (L) were located on the right side of the bifurcation plane, and only 3 low performers were located on the left side of the bifurcation plane. Probability

FIGURE 4
Stochastic Distribution of New Employees with High (H) and Low (L)
Job Performance on the Control Surface ($N = 45$)

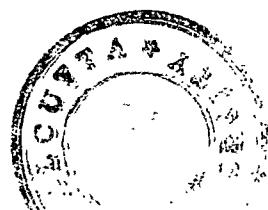
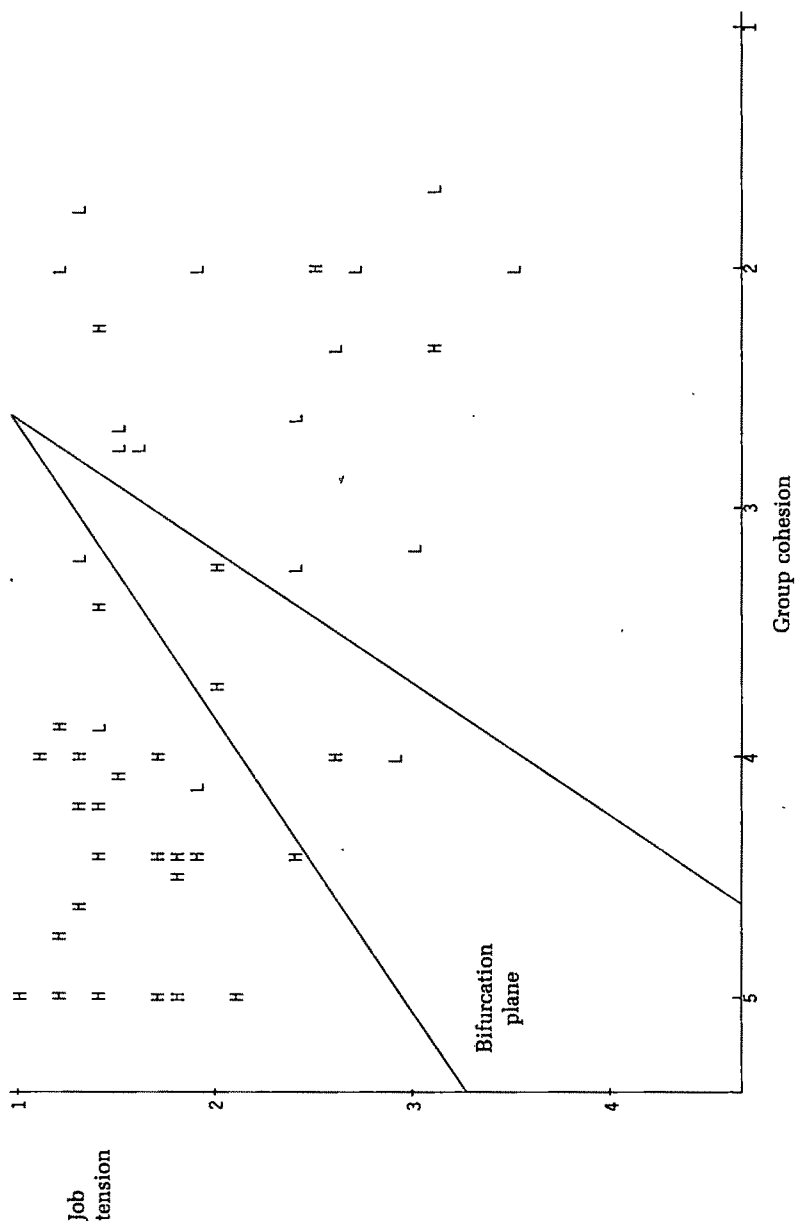
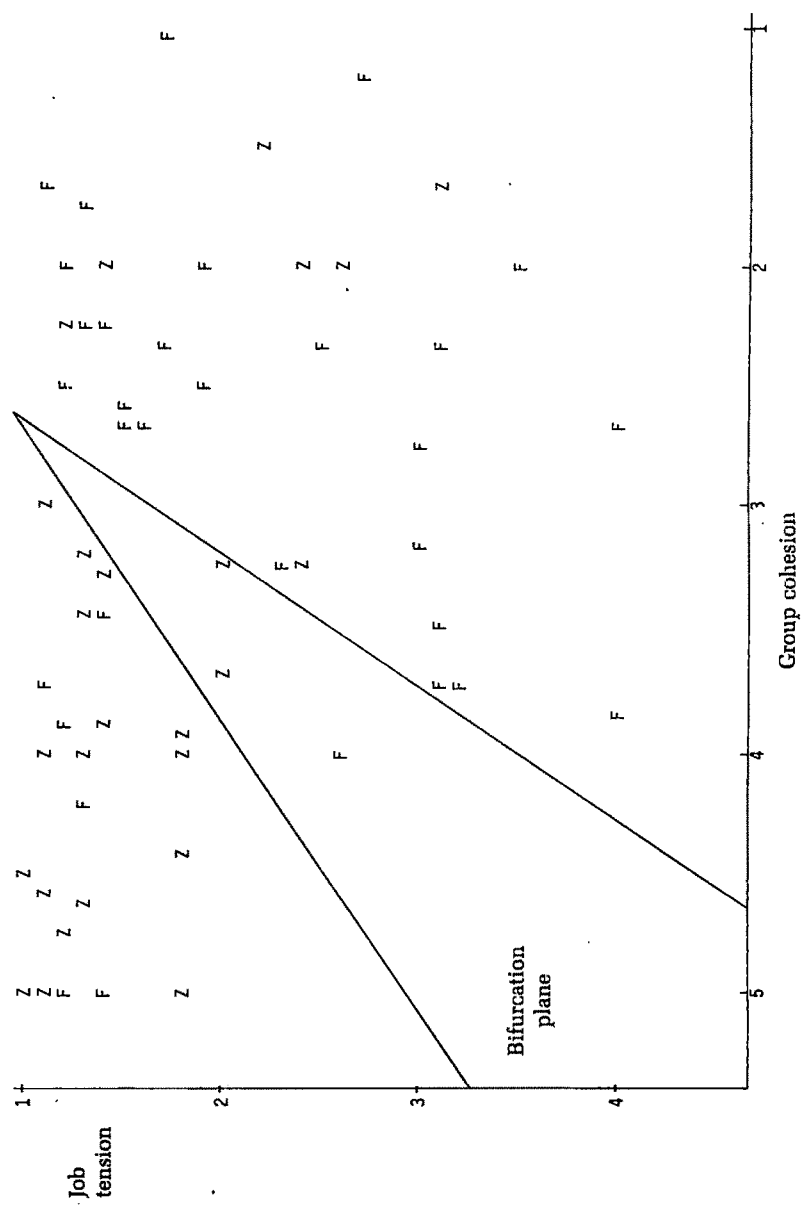


FIGURE 5
Stochastic Distribution of New Employees with Zero (Z) and Frequent (F)
Absenteeism Rates on the Control Surface ($N = 58$)



inferences from the binomial distribution indicated that it was unlikely ($p < .01$) that this disproportionate distribution of high and low job performance observations could represent a chance occurrence.

Figure 5 indicates that 17 of the 26 new employees characterized as having zero (Z) absenteeism were located on the left side of the bifurcation plane. Conversely, 25 of the 32 new employees characterized as having frequent absenteeism (F) were located on the right side of the bifurcation plane. Probability inferences from the binomial distribution also indicated that it was unlikely ($p < .05$) that this disproportionate distribution of frequent and zero absenteeism observations could represent a chance occurrence. Overall, the analyses of the stochastic models indicate that all three withdrawal behaviors represent discontinuous outcomes of sociopsychological withdrawal rather than a continuous linear function of tension and cohesion. Changes in employee retention, absenteeism, and job performance appeared to occur only when the bifurcation values of tension and cohesion were exceeded.

DISCUSSION

The results of this study, which generally support the proposition that the behavioral outcomes of withdrawal can be explained as discontinuous changes in employee behavior rather than as continuous linear responses to sociopsychological withdrawal, have important implications for both turnover and withdrawal research. The strongest support for a cusp-catastrophe model of withdrawal transitions was found with a model using absenteeism as the measure of current withdrawal behavior. This cusp model explained 20.7 percent of the variance in turnover for new employees and 14.2 percent of variance in turnover for employees with longer seniority. Weaker evidence was found for a hypothetical fold-catastrophe model using job performance as the measure of current withdrawal behavior. This fold-catastrophe model explained less variance in turnover than a comparative linear-interaction model for both new and longer-term employees.

The variance in turnover explained by the cusp-catastrophe model compares favorably with an average of 22 percent of the variance explained by other recent studies, which used from 13 to 18 variables to explain turnover with linear multivariate models (Arnold & Feldman, 1982; Bluedorn, 1982b; Koch & Rhodes, 1981; Parasuraman, 1982; Price & Mueller, 1981). Adding numerous predictor variables to the explanatory models does not appear to substantially increase the explained variance in employee turnover observed in the more heterogeneous samples. At this time, it might be beneficial for researchers to redirect their efforts and examine the form of the underlying relationships more closely than they have in the past; they might also identify cohorts in which the withdrawal phenomenon is most likely to occur.

The results obtained for the stochastic models suggest that performance, absenteeism, and turnover all reflect discontinuous responses to sociopsychological withdrawal. The stochastic model achieved 86 percent predictive accuracy among the turnover observations for new employees com-



pared to 58 percent predictive accuracy for a linear interaction model. The criterion for the predictive accuracy of the linear interaction model was that leavers should have predicted scores above the median predicted value, since there was a 51 percent turnover rate among new employees. Seven employees having predicted scores at the median value were randomly deleted from the computation to make the sample accuracy for the linear model comparable to the estimate for the cusp-catastrophe model that omitted the seven employees located in the bifurcation plane. Using these criteria, the linear model yielded 18 false negative predictions (23%) for leavers with predicted scores below the median value and 15 false positive predictions (19%) for stayers with predicted scores above the median value, resulting in total predictive accuracy of 58 percent.

Sheridan and Abelson (1983) reported similar patterns of higher accuracy when using catastrophe rather than linear models. Of course, the predictive results favoring the catastrophe model in the current study came from a rather unique population of new employees in nursing homes where employees had a high propensity to leave. It remains to be shown whether the cusp-catastrophe model can demonstrate the same predictive results in other organizations and populations with less turnover.

Another implication of this study was that declining job performance, absenteeism, and turnover could all be considered different outcomes of the same withdrawal phenomena. This viewpoint disagrees with conclusions reached by other researchers (Adler & Golan, 1981; Clegg, 1983; Steers & Rhodes, 1978). There are two important differences between the designs of previous studies and that of the present research that may explain the contradictory conclusions. First, this study examined withdrawal behavior within a cohort of new employees from different organizations chosen to be homogeneous in terms of seniority, whereas conclusions of previous studies were based on data from heterogeneous cross-sectional samples of all employees in the organizations studied.

Although it would seem likely that the withdrawal phenomenon would occur over a relatively short period of time, if it were to occur at all, it is less likely that sociopsychological withdrawal would lead to the same behavioral outcomes for employees at all levels of job seniority and career stages, or that the expected withdrawal behaviors would be consistently related to each other in the same direction within large heterogeneous samples. To validly assess the behavioral effects of withdrawal, it may be necessary to direct research efforts to studies of homogenous samples of employees at the same career stage or in the same seniority cohort rather than to studies of heterogeneous cross-sectional samples of all employees in an organization. Individual differences in the cross-sectional samples may confound the analyses of strong withdrawal effects occurring within particular sample cohorts. Further research could demonstrate that different sociopsychological variables may control withdrawal within different cohort groups but that withdrawal results in a common set of behaviors.

A second difference between this study and previous research designs is that the catastrophe model does not presume continuous relationships between declining job performance, absenteeism, and turnover. These behaviors are not viewed as progressive outcomes along a continuum of withdrawal, but rather as multiple and discontinuous outcomes of withdrawal. Employees may abruptly change to different behaviors even when there are small changes in the sociopsychological variables controlling withdrawal.

Catastrophe modeling of multi-behavior response surfaces has potential for future withdrawal research. As Oliva and Capdeville (1980, p. 230) state:

The single biggest contribution of catastrophe theory to the behavioral sciences is that it moves us away from single-valued response surfaces. For years we have lost the richness found in many behavioral situations because we have mapped them down to single valuedness. If catastrophe theory does nothing else, it may help to move the behavioral science [sic] into a new era of modeling, not because of some inherent truth in the theory, but through the realization that response surfaces do not have to be single valued and smooth.

The results of this study and of Sheridan and Abelson's (1983) study demonstrate the feasibility of building catastrophe models of employee turnover. Such catastrophe models have significant predictive validity. Nevertheless, the magnitude of the remaining unexplained variance indicates a need to more systematically incorporate variables measuring individual differences into the analyses of catastrophe models in order to diminish the problem of "spurious functionalization" (Sussman & Zahler, 1978: 197). Individual differences in demographic, family, or financial variables may account for a large segment of the remaining unexplained variance. To increase explained variance, it may be necessary to build catastrophe models within more specific cohort groups determined by both seniority and individual demographic variables. Of course, the utility of developing more precise models of withdrawal behavior within narrowly defined groups must be weighed against the usefulness of developing more generalized linear multivariate models.

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MENTORING ALTERNATIVES: THE ROLE OF PEER RELATIONSHIPS IN CAREER DEVELOPMENT

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Little is known about work relationships, other than mentoring relationships, that contribute to adult and career growth. A biographical interview study of 25 relationship pairs indicated that relationships with peers offer important alternatives to those with conventionally defined mentors. This study identifies types of peer relationships, highlights various enhancing functions these relationships provide, and shows the unique manner in which these relationships can support psychosocial and career development at every career stage.

Both adult development and career theorists have described the mentoring relationship as having great potential to enhance the development of individuals in both early and middle career stages (Dalton, Thompson, & Price, 1977; Hall, 1976; Levinson, Darrow, Klein, Levinson, & McKee, 1978). Studies of this relationship suggest that it can be instrumental in supporting both career advancement and personal growth (Clawson, 1979; Kram, 1985; Levinson et al., 1978; Phillips-Jones, 1982). The purpose of this paper is to consider how other adult relationships in work settings—relationships with peers—can offer both similar and unique opportunities for personal and professional growth. A brief review of recent research highlights the advantages and the limitations of the conventional mentoring relationship, and indicates why it is essential to begin investigation of other developmental relationships in organizations.

RELATIONSHIPS WITH MENTORS

Levinson et al. (1978) state that relationships with mentors enable young adults to successfully enter the adult world and the world of work by simultaneously assisting in career growth and the establishment of separate identities. Studies of mentoring have further delineated specific developmental func-

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tions provided by these relationships (Clawson, 1979; Kram, 1985; Phillips, 1977). Mentors provide young adults with career-enhancing functions,¹ such as sponsorship, coaching, facilitating exposure and visibility, and offering challenging work or protection, all of which help the younger person to establish a role in the organization, learn the ropes, and prepare for advancement. In the psychosocial sphere, the mentor offers role modeling, counseling, confirmation, and friendship, which help the young adult to develop a sense of professional identity and competence. In providing these functions, an experienced mentor gains technical and psychological support, finds internal satisfaction in enabling a younger colleague to learn how to navigate in the organizational world, and gains respect from colleagues for successfully developing younger talent for the organization.

The fact that both individuals benefit from the relationship makes it vital and significant. Complementarity of needs solidifies a mentor relationship during the initiation phase, and propels it forward to the cultivation phase when the range of functions provided by the relationship expands to its maximum (Kram, 1983). Eventually, changes in organizational circumstances or in the individuals' needs cause the relationship to move to a new phase. For example, organizational changes like transfers, promotions, and demotions, as well as individual changes like a sense of increased confidence or a growing need for independence, have been found to alter the context of the mentoring relationship. The outcome is often feelings of anger, loss, or anxiety as the pair of individuals enters the separation phase of the relationship. As a mentoring relationship moves into the separation and redefinition phases, it ceases to provide many of the central functions that previously gave it such importance. The predictability of the phases of a mentoring relationship demonstrates that inevitably this special kind of valued support ends (Kram, 1983; Levinson et al., 1978; Phillips-Jones, 1982).

PEER RELATIONSHIPS

This paper assumes that a wider range of developmental relationships that should be investigated exists. The premise that many relationships are important to development has a long and rich history (Neugarten, 1975; Storr, 1963; Sullivan, 1953). Over the years, social psychologists have enriched the idea that the self or personality develops within a social nexus of relationships, at the center of which there is a core group from which the individual learns new behaviors and gains a positive sense of self (Ziller, 1963). Most recently, Levinson et al. (1978) developed a concept of the life structure, which effectively describes an individual's relationship with different parts of the world. They also state that individuals selectively use and are used by their worlds through evolving relationships. Each of these social scientists has maintained the importance of relationships in enabling individual development and growth throughout successive life and career stages.

¹Career-enhancing functions in this paper are the same as the Career Functions discussed in earlier work (Kram, 1980, 1983, 1985).

Yet, while we know the general importance of relationships, we know little about adult relationships other than the mentoring relationship that directly encourage, support, and contribute to progress in life and career. In work settings, it appears that there are many relationships that could meet developmental needs. Relationships with bosses, subordinates, and peers offer alternatives to the mentoring relationship, a relationship that is relatively unavailable to many individuals in organizations (Kram, 1985; Levinson et al., 1978).

A first step in the investigation of other developmental relationships in organizations is a systematic study of the nature of relationships with peers. A previous study of mentoring relationships strongly suggested the potential significance of peer relationships (Kram, 1980). In that intensive interview study of 18 pairs of junior and senior managers involved in mentoring relationships with each other, many individuals referred to the importance of relationships with peers when a mentoring relationship was changing or ending, or when a particular relationship failed to meet critical developmental needs.

Peer relationships appear to have the potential to serve some of the same critical functions as mentoring, and also appear more likely to be available to individuals. By definition, in a hierarchical organization the individual is likely to have more peers than bosses or mentors. Furthermore, the lack of the hierarchical dimension in a peer relationship might make it easier to achieve communication, mutual support, and collaboration than it would be in a mentoring relationship.

The primary purpose of this study, therefore, was to understand the nature of peer relationships among managers and other professionals in one organizational setting. The research design was guided by three primary questions:

1. *For what purposes do individuals form and maintain peer relationships?*
2. *Can distinctive kinds of peer relationships be identified?*
3. *What are the functions of peer relationships at different career stages?*

RESEARCH METHODS

This exploratory study was designed to examine the nature of supportive and significant peer relationships at early, middle, and late career stages. Three researchers, two women and one man, composed the research team. The research was conducted in a large, northeastern manufacturing company. Members of the human resource staff facilitated our introduction into the organization. This staff provided an initial list of potential research participants, selected according to four criteria established in advance by the research team.

Participants

The first criterion for selection of participants was age. Extant literature suggested that individuals work on different developmental tasks at different ages and career stages in the context of their relationships (Erikson, 1963, 1968; Levinson et al., 1978). Therefore, it seemed important that we allow such differences to be manifested, lest what we discover about peer relationships represent only one age or career-stage group. Three age groups of 25–35, 36–45, and 46–65 were identified as most likely to represent individuals in early, middle, and late career stages. While career stage and adult life stage are not always synonymous, as when, for instance, an individual at midlife launches a new career, our sample consisted of managers for whom life stage and career stage were highly correlated.

Gender of participant was the second criterion for participation in the study. Since our research was to focus on expanding our knowledge of adult relationships with peers at work, we believed it was important to have as many female participants as male. While this balance may not reflect the demographics of the organization, we decided that we could make the most valuable contribution to an understanding of adult relationships if both male and female perspectives were equally represented.

The final two criteria involved tenure in the organization and willingness to participate. The human resources staff saw all individuals who appeared on our initial list as genuinely interested in sharing their perspectives and as comfortable with doing so in interviews. In addition, three years tenure in the organization was required. We felt that this period was sufficient to give an opportunity for a peer relationship to develop.

From the original list, the research team randomly selected five people from each age category. We sent letters to these individuals inviting them to participate in the study and then called them on the phone to answer questions they might have and to formally request their participation. Two individuals from the original sample declined, both because of current time pressures, and were replaced by contacting others on the original list. In all, the final sample consisted of six people in early-career (25–35), five in middle-career (36–45), and four from late-career (46–65) stages (see Table 1).

The research strategy was to let the 15 focal people select up to two individuals with whom they had supportive relationships and to then interview those significant others. Because the research itself encouraged the discussion of “special” important relationships, it was imperative to build in a chance for “less special” relationships to emerge. Allowing up to two relationships to be explored for each focal person increased the possibility that different types of relationships would be discussed. This sampling strategy resulted in 25 pairs. Eleven focal people wished to talk about two relationships, three people cited one relationship, and one individual named no significant peer relationship.

TABLE 1
Research Participants

Focal Person			Significant Others		
Organizational Status ^a	Age	Gender	Gender	Age	Organizational Status ^a
Early career:					
Subsection manager	32	F	F	35	Subsection manager
			M	55	Unit manager
Unit manager	32	M	M	36	Individual contributor
			M	32	Individual contributor
Unit manager	32	M	M	32	Subsection manager
			M	40	Section manager
Individual contributor	31	F	M	38	Individual contributor
Individual contributor	29	F	F	34	Subunit manager
			M	29	Individual contributor
Individual contributor	27	M	M	36	Individual contributor
			M	32	Individual contributor
Middle career:					
Section manager	45	M	M	48	Subsection manager
			M	52	Section manager
Section manager	43	M	M	38	Section manager
			M	39	Section manager
Unit manager	43	F			None
Unit manager	36	M	M	42	Subsection manager
			M	34	Unit manager
Individual contributor	42	F	F	55	Unit manager
Late career:					
Section manager	58	F	F	42	Subsection manager
			M	53	Subsection manager
Subsection manager	61	M	M	59	Subsection manager
Unit manager	63	M	M	63	Individual contributor
			M	57	Unit manager
Individual contributor	55	F	F	57	Individual contributor
			M	63	Individual contributor

^aThe organizational hierarchy progresses from individual contributor to unit manager to subsection manager to section manager.

Interviews

The interviewing sequence with the 15 focal people consisted of two 1½ to 2 hour sessions. During the first session, the primary task was to establish rapport with the focal person and to review the individual's career history. By the end of that first interview each focal person was asked to identify "those two relationships with colleagues which you feel support your personal or professional growth." During the second interview, the significant relationships were explored at length by focusing on reconstructing the history of the relationship, the participant's emergent thoughts and feelings at different times about the relationship, and the role that the relationship was perceived to have in career growth. At the end of the second interview, we obtained permission to contact the significant other(s). We

subsequently invited each significant other to participate in a similar interview sequence; all of them agreed to participate.

The interviewing methods were similar to the biographical interviewing method that Levinson et al. (1978) used in their study of adult development. The method combines elements of a structured research interview, a clinical interview, and a conversation between friends. Such an interview is both sufficiently structured to insure that certain topics are covered and sufficiently flexible to allow the interviewee to focus on what is of special and particular importance. Because the study involved interviews with pairs of managers or professionals, both individuals were assured complete confidentiality; that is, no information from either's interview was shared with the other.

Each interview was guided by a detailed set of interview questions formulated by the research team. While each researcher had the flexibility to ask any one question in a number of different ways, depending upon the emerging tone of the interview and the style of the interviewer, the research team agreed in advance to cover broad topic areas in generally the same order. All interviews were tape recorded and transcribed so that the raw data could be systematically analyzed.

Prior to beginning the data collection, the research team met on several occasions to discuss and articulate the particular ideas and concepts which each had formed in regard to peer relationships. This articulation of our *a priori* assumptions (Post & Andrews, 1982) was a critical process in the research. It insured that we understood the biases we brought to the research as individuals and as a team. We could, therefore, take care to minimize the impact of our biases on the data collected.

The research team also met weekly during the interviewing phase to talk about any difficulties or concerns any interviewer had experienced. These meetings helped keep individual interviews as free of interviewer bias as possible and provided an awareness of the effects of each interviewer on the data collected. A second function of these conferences was to double-check that the relationships which were emerging were, in fact, peer relationships and not conventional mentoring relationships. From previous research, we knew that mentors tended to be much older and several organizational levels higher, and that the mentoring relationship was characterized as a one-way helping relationship. We used these criteria to evaluate the emerging peer relationships; none of the emerging relationships met the mentoring criteria.

Data Analysis

Our analysis of peer relationships followed the grounded theory approach of Glaser and Strauss (1967) as described by Post and Andrews (1982). We reviewed the transcripts for concepts and themes that might illuminate the nature of peer relationships and their role in career development. Throughout the data collection process, researchers were developing their own emergent hypotheses, which were constantly shared and compared with the ideas of the others. Once all the data were collected, we met for several full day

sessions at which we jointly analyzed the data, paying special attention to similarities and differences across relationships.

The process of data analysis, conducted in the manner described by Post and Andrews (1982) and Sanders (1982), involved searching the data for initial categories that seemed to reflect similarities across cases (e.g., intensity of relationship, level of commitment, age-organizational level combination, issues worked on, needs satisfied). We derived these preliminary categories from the hypotheses that emerged throughout the data collection. Cases which appeared to fit the category under examination were grouped together. This process served to verify the usefulness of each category, to establish its basic properties, and to delineate when and to what extent the category existed (Post & Andrews, 1982). When even one particular relationship did not effectively illustrate a concept, we concluded that the concept was inadequate.

While placement into initial categories maximized similarities and minimized differences, the constant comparative method (Glaser & Strauss, 1967) requires that differences be maximized as well. According to Post and Andrews (1982), diversity is sought to stretch a concept to its limits and its depths, an effort that insures that the categories and theory developed are well integrated. The final concepts and themes developed were those that revealed both the similarities and the differences across cases, accounted for all relationships studied, and were accepted as doing so by all members of the research team. While achieving such a consensus was not easy, it insured that the resultant conceptualization of peer relationships would be both comprehensive and compelling (Isabella, 1983).

CHARACTERISTICS OF PEER RELATIONSHIPS

The results of this study suggest that peer relationships offer an important alternative to conventional mentoring relationships by providing a range of developmental supports for personal and professional growth at each career stage. Through systematic analysis of the 25 relationship pairs, we identified a range of career-enhancing functions similar to those found in mentoring relationships (Kram, 1980). In addition, the analysis indicated that some peer relationships only provide one career-enhancing function, while others provide a wide range of career-enhancing and psychosocial functions. As a consequence, we defined a continuum of relationships that highlights several different types of peer relationships. Finally, interviews with individuals at different career stages suggested that not only are there different types of peer relationships, but that these types may be modified and shaped by the age and career concerns of both individuals. Therefore, we present speculations about how age and career stages shape different peer relationships.

Developmental Functions

Peer relationships function so as to provide a variety of developmental benefits. Many of these are similar to the career-enhancing functions and

psychosocial functions that are observed in conventional mentoring relationships (Kram, 1985; Levinson et al., 1978; Phillips, 1977). Table 2 displays the developmental functions of peer relationships that were derived from analysis of the interview data, and compares them with the developmental functions found in mentoring relationships.

TABLE 2
Developmental Functions—Comparison of Mentoring
and Peer Relationships

Mentoring Relationships	Peer Relationships
Career-enhancing functions <ul style="list-style-type: none"> • sponsorship • coaching • exposure and visibility • protection • challenging work assignments 	Career-enhancing functions <ul style="list-style-type: none"> • information sharing • career strategizing • job-related feedback
Psychosocial functions <ul style="list-style-type: none"> • acceptance and confirmation • counseling • role modeling • friendship 	Psychosocial functions <ul style="list-style-type: none"> • confirmation • emotional support • personal feedback • friendship
Special attribute <ul style="list-style-type: none"> • complementarity 	Special attribute <ul style="list-style-type: none"> • mutuality

In providing career-enhancing functions, a peer relationship can aid in organizational advancement:

Basically, it was the type of relationship, I think, I was always ahead of her one assignment. I would feed back to her about the other assignments that I've heard of and how the assignments were. Mainly, what I was trying to do was have her benefit from my experience and recommend jobs that I thought were better or worse for her to go after. I think we developed a career counseling relationship.

Within the context of a relationship of this kind, information sharing gives both individuals technical knowledge and perspective on the organization that better enable them to get their work done. In addition, through career strategizing, individuals can discuss their career options and dilemmas, finding in a peer a medium for exploring their own careers. Finally, peers give and receive feedback concerning work-related matters that lets them evaluate their own experiences.

In providing psychosocial functions, a peer relationship can support an individual's sense of competence and confidence in a professional role. Psychosocial functions are more frequently observed in peer relationships that are more intimate, of longer duration, and characterized by higher self-disclosure and trust:

He is one of my closer friends right now . . . I'll just walk into his office and bounce off gripes that I have or things that I am doing

or ask advice that I need and he'll do the same thing. I think a lot of sounding board stuff.

Our careers are kind of parallel in that we're about the same age, we're both single, we both like to go out and party a lot and are a little less serious about work than some other people. And we're doing similar types of jobs at work.

Within the contexts of these relationships, peers are able to provide confirmation to each other through sharing perceptions, values, and beliefs related to their lives at work and through discovering important commonalities in their viewpoints. Secondly, peers can provide emotional support by listening and counseling each other during periods of transition and stress. Third, in discussing areas that extend beyond the specific job-related concerns addressed by career functions, peers offer each other a personal level of feedback that can be an invaluable aid to their (a) learning about their own leadership style, (b) learning how they affect others in the organization, (c) seeing how they are managing work and family commitments. Finally, peer relationships can provide friendship, encompassing concern for each other that extends beyond work itself to the total human being.

While many of these functions are similar to those characteristic of mentoring relationships (see Table 2), one special attribute makes them unique. Peer relationships offer a degree of mutuality that enables both individuals to experience being the giver as well as the receiver of these functions. In contrast to a mentoring relationship, where one individual specializes in the role of guide or sponsor (Kram, 1980; Levinson et al., 1978), in a peer relationship both assume both kinds of roles. This mutuality appears to be critical in helping individuals during their careers to develop a continuing sense of competence, responsibility, and identity as experts. In fact, peer relationships can endure far longer than relationships with mentors. Whereas a mentoring relationship generally lasts between three and six years (Kram, 1983), some peer relationships seen in our study began in early career and continued through late career, lasting as long as 20 or 30 years.

A Continuum of Peer Relationships

In the research sample of 25 relationships, there was considerable variation in the combinations of the developmental functions described above. We identified three types of peer relationships, each type characterized by a particular set of developmental functions, a unique level of trust and self-disclosure, and a particular context in which the relationship had evolved.

We will describe the primary functions, tone, and context of the peer relationship we observed as three distinct points on a continuum (Figure 1), since these best illuminate the three major types of relationships in our sample. However, we offer them as points of reference rather than the only variations that may exist. Criteria used for placement along the continuum, and how these are related to initial organizing concepts used in the data analysis, are illustrated in Table 3.

FIGURE 1
A Continuum of Peer Relationships

Information Peer	Collegial Peer	Special Peer
Primary Function	Primary Functions	Primary Functions
Information-sharing	Career strategizing Job-related feedback Friendship	Confirmation Emotional support Personal feedback Friendship

Information peer. The information peer is so called because individuals in this kind of relationship benefit most from the exchange of information about their work and about the organization. This peer relationship is characterized by low levels of self-disclosure and trust. As a result of the focus on information exchange and infrequent contact, individuals receive only occasional confirmation or emotional support. While an information peer might receive a small amount of job-related feedback, there is insufficient trust or commitment to allow for personal feedback:

I think it's just a friendly exchange, very little giving back and forth. It's primarily informational That's probably what he gives to me and I think that's what he would say I give to him. I don't think he would look at me as giving him any insight into how he's running his business — we don't get into shop in that regard.

From the career histories of the participants, we learned that the information peer relationship appears to be a common one in organizations. Preliminary evidence suggests that individuals are likely to maintain large numbers of these relationships. Such relationships demand little, and appear to offer a number of benefits derived from the information shared. While this kind of peer relationship may serve a limited social function in providing some degree of familiarity or friendship, it offers little of the ongoing career or psychosocial support characteristic of the other two types. Exhibit 1 displays how individuals in information peer relationships characterized those relationships.

Collegial peer. The collegial peer relationship is typified by a moderate level of trust and self-disclosure and is distinguished from the information peer relationship by increasingly complex individual roles and by widening boundaries (see Exhibit 1). In this kind of relationship, the information sharing function is joined by increasing levels of emotional support, feedback, and confirmation. Individuals are likely to participate in more intimate discussions of work and family concerns. With greater self-expression in the

TABLE 3
Criteria for Placement Along Continuum of Peer Relationships

Initial Organizing Categories	Information Peer	Collegial Peer	Special Peer
Level of commitment	Demands little, but offers many benefits.	Information sharing joined by increasing levels of self-disclosure and trust.	Equivalent of best friend.
Intensity of relationship	Social but limited in sharing of personal experience.	Allows for greater self-expression.	Strong sense of bonding.
Issues worked on	Increases individual's eyes and ears to organization (work only).	Limited support for exploration of family and work issues.	Wide range of support for family and work issues.
Needs satisfied	Source of information regarding career opportunities.	Provides direct honest feedback.	Offers chance to express one's personal and professional dilemmas, vulnerabilities, and individuality.

context of the relationship, there is greater opportunity for confirmation and validation of self-worth:

Nathan and I, oh, he's ten feet away. I see him many times. When one of us has a tough thing we'll wander over to the other's office and bitch a little bit and commiserate.

There's a lot of give and take — on a professional basis and on a social basis. Professionally we're both learning at the same time. He's a manager a little less than a year more than me. So he had a bit of an advantage, but I think we're growing and experiencing things simultaneously. There's a lot of sharing about experiences with our people and about different situations arising. So we reinforce one another in that respect.

Our career histories of participants indicate that individuals may have a limited number (2–4) of such relationships. These tend to be with people who at one time worked within the same department where ongoing work contact encouraged the formation of a relationship. The primary functions provided by the collegial peer relationship are career strategizing, job-related feedback, and friendship, as well as some information sharing, confirmation, and emotional support. These distinctions are best highlighted when set against the unique offerings of the special peer relationship (see Exhibit 1).

Special peer. The point farthest right on the continuum represents the special peer, the most intimate form of peer relationship. Becoming a special peer often involves revealing central ambivalences and personal dilemmas in work and family realms. Pretense and formal roles are replaced by greater self-disclosure and self-expression. Through the widest range of career-enhancing and psychosocial support, individuals find support, confirmation and an essential emotional connection that enables profound work on salient developmental tasks:

I can say anything to Art and he will be understanding. I am able to get frustration and anger out in a more constructive fashion talking to him. We do that for each other.

It's relatively intangible . . . I think we enjoy one another's company . . . It is nice to have somebody to talk to about certain things that you might not be able to talk about, perhaps, with the person next to you.

We are genuinely happy for each other's successes, and we try to help each other with major decisions . . . The thought that would be depressing is if either one of us leaves. Friends of different levels come and go, but we've had much more of a sustained relationship. I generally always have one close friend, and this has been the longest.

The career histories suggested that the special peer relationship is rare. Individuals in this sample typically mentioned a small number (1–3), or none at all. Special peer relationships generally take several years to develop and tend to endure through periods of change and transition. Thus, they offer not only intimacy and confirmation, but continuity and stability as well. In addition to the advantages that information peers and collegial peers gain in their relationships, special peers often have a sense of bonding with

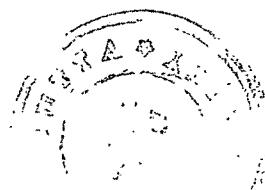
EXHIBIT 1

Examples of Participants' Descriptions of Three Types of Peer Relationships

Information Peer	Collegial Peer	Special Peer
<p>"Most important of our relationship is the interchange or discussions about work. We talk about what management and budget problems mean to us, to the organization, and to the people we work with."</p>	<p>"I consider him a friend, I'll call if I have a question, whether business or personal, when I need to compare what would be the right thing to do. He's one of the first people I call."</p>	<p>"She's the one person that I can open up with and know I'll be accepted, that she isn't going to be shocked with things I say and that a lot of them she'll understand because she shares similar values."</p>
<p>"It's a relationship in which we look to each other to provide certain kinds of information."</p>	<p>"He's just the kind of person who always comes in and says: Hi, how are you doing, how was your weekend or your evening? How are you doing today? He's just a good, supportive, open, wonderful person and I really look forward to seeing him every day."</p>	<p>"We're pretty open and trustful of one another and we'll give a valued judgment even if it's wrong. I think the other is willing to accept that."</p>
<p>"We exchange technical ideas. We talk about work and technical problems. His problems and mine. I contribute ideas to him and he contributes to me."</p>	<p>"We talk about all sorts of things . . . from business to personal. It is always helpful to talk about those with someone you can trust."</p>	<p>"I do see our relationship as a need that each of us have for someone and making the best of things that are similar and liking each other and recognizing that there are differences."</p>

EXHIBIT 1 (continued)

Information Peer	Collegial Peer	Special Peer
<p>"He calls me periodically during work to talk about some technical issue, if he's looking for some information and I would do the same. We look to each other to provide certain kinds of information on technical issues."</p>	<p>"It's a working relationship. We do very little socializing outside of work. We might go grab a couple of beers once a month or go to the Mexican restaurant and see if we can run the margarita bill as high as the food bill We just chum around at work."</p>	<p>"Our relationship is mostly friendship and trust and confidence, but that is the underlying thing we feed on. It's much more than just work."</p>
<p>"He's someone I've done things with, like take breaks, and I enjoy that. On the other hand, I would assume that other people fill that role too."</p>	<p>"He helps me out, particularly on administrative stuff. We share experiences. We do that several times a day when we walk back and forth to each other's offices."</p>	<p>"She's the one person in my life with whom I can talk about anything. She knows much more about me, my thinking, and my life than most people do."</p>
<p>"I've seen him a couple of times when I've gone across the street to lunch. It's easy to sit down and talk with him. That's probably three times a year."</p>	<p>"The organization was new to her, people were new to her, and I knew she would have a period of time until she got to know the organization. I helped her along by just being there when she needed help."</p>	<p>"We have no family responsibilities. We've gone on vacations together, gone away for weekends together, party together. He's my closest friend."</p>



one another, which can provide both with a strong sense of security, comfort, and belongingness on the job. The special peer relationship provides reliable and candid personal feedback, emotional support, career strategizing, and ongoing confirmation of each individual's competence and potential (see Exhibit 1).

While the information peer, collegial peer and special peer relationships reflect different combinations of developmental functions, each also seemed to encompass what the individual brought to the relationship in terms of expectations and developmental tasks. We clarified how individuals' expectations and developmental tasks may have shaped each type of peer relationship by examining dominant themes of these relationships at different career stages, and by speculating beyond the limits of our sample of 25 relationships. The following discussion of peer relationships at different career stages, therefore, while grounded in our data, also represents an extension of that data.

Relationships at Different Career Stages

The three types of peer relationships on the continuum seem to be perceived somewhat differently by individuals at different career stages. These variations appear to be related to the particular developmental tasks that each person brings to the relationship. Since developmental tasks involve salient concerns about self, career, and family that characterize each career stage, it is not surprising that these tasks might shape what is brought to a peer relationship (Dalton et al., 1977; Levinson et al., 1978; Schein, 1978). Thus, while the primary functions of each type of relationship do not change, the content of what is discussed and the process through which that content is shared are different at successive career stages.

These differences in the content of peer relationships at successive career stages are captured in the dominant themes of each type of relationship at each major career stage (see Table 4). Differences that seemed to be related to individuals' developmental tasks clustered roughly around early, middle, and late career stages, with one exception. In order to adequately account for the spread of developmental tasks in early career, we have separated early career into establishment and advancement. The establishment stage is comprised of people in their 20s, the advancement stage of people in their 30s, middle career of people in their 40s to early 50s, and late career with people in their mid-50s and beyond.

Dominant themes in the establishment stage. Concerns about competence and professional identity often characterize the developmental needs of a person in the establishment phase of early career (Hall, 1976; Levinson et al., 1978; Schein, 1978; Super, 1957). Two themes seemed to be common to all people in their 20s in our sample: (1) concern for their professional identity—for defining who they were as managers and professionals—and (2) desire to feel self-confident and competent as they went about learning the ropes of organizational life.

TABLE 4
Dominant Themes of Peer Relationships
at Successive Career Stages

Stages	Information Peer	Collegial Peer	Special Peer
Late Career	Maintaining knowledge	Assuming consultative role Seeing others as experts	Preparing for retirement Reviewing the past Assessing one's career and life
Middle Career	Networking Maintaining visibility	Developing subordinates Passing on wisdom	Threats of obsolescence Reassessment and redirection Work/family conflicts
Advancement	Preparing for advancement Gaining visibility	Gaining recognition Identifying advancement opportunities	Sense of competence and potential Commitment Conformity vs. individuality Work/family conflicts
Establishment	Learning the ropes Getting the job done	Demonstrating performance Defining a professional role	Sense of competence Commitment Work/family conflicts

Dominant themes for each type of peer relationship in the establishment stage reflect these developmental concerns (see Table 4). The information peer relationship—in providing information sharing—is characterized by the exchange of information that helps the novice learn the ropes of the organization and get the job done. The collegial peer relationship—through career strategizing, job-related feedback, and friendship—is characterized by conversations about evolving professional roles and job performance. The special peer relationship—in providing confirmation, emotional support, personal feedback, and friendship—is characterized by intimate discussions about making a commitment to the new career, managing the stresses of work and family, and anxieties about competence.

The process of a peer relationship in the establishment stage seems to be similar to that which might characterize a mentoring relationship. By this we mean that the other is viewed as having more wisdom or experience and is described as a model and as a career guide, even though a peer:

Terry struck me to be very intelligent, career oriented, knowing where she wanted to go. Those were all the kinds of things that I need to look up to . . . Terry was really leading me around. It was virgin territory we were getting into. Terry was really a good one to get in there and plow and pioneer it.

I think Terry has a better way of dealing with some situations than I do. She says she is going to do something and she does it. Whereas I tend to procrastinate a little more, not so willing to take a risk that she will take. She has guided me in that sense.

Thus, this special peer relationship in the establishment stage, by providing confirmation, emotional support, personal feedback, and friendship, helped the individual to define a professional role and to acquire competence and confidence. To the extent that these relationships, especially the collegial peer and the special peer, involve a sense of "looking up to" peers for guidance, they offer an alternative to conventional mentoring.

Dominant themes in the advancement stage. As individuals become established in their chosen professions and begin to internalize feelings of competence and mastery, needs and concerns associated with advancement in the organization and in a profession take on new importance (Hall, 1976; Schein, 1978; Super, 1957). No longer burgeoning novices, individuals in the career advancement stage in our sample seemed to want to dig in, get ahead as they defined it, work through conflicts arising between work and family commitments, and most of all "settle down" (Levinson et al., 1978) into their lives and build specialized career niches.

Dominant themes for peer relationships in this career stage appear to be shaped by these developmental tasks (see Table 4). Thus, the information peer relationship can provide information that enables individuals to create opportunities for future advancement through increased knowledge of the organization as well as through increased visibility to those who make promotional decisions. Similarly, the collegial peer relationship, in providing career strategizing or feedback, can further the individuals' attempts to gain recognition and to identify realistic advancement options. Finally, ongoing haring with special peers can help individuals to grapple with work/family conflicts and with concerns about their potential and the extent to which they are willing to make commitments and conform to the demands of the organization.

The elevation of one member to a superior plane no longer characterizes relationships at this time. All persons in their 30s tended to perceive themselves as equal to the other, even if that other person was older or at a different career stage or organizational level, and even if the other person did not share this perception. There seemed to be a real need among people in the advancement stage to perceive and experience this sense of equality:

I don't consider him like a boss. It's more like a peer relationship. I don't feel equal in responsibility, but I feel equal in ability to influence his thought. I mean I will go and deal with him more on an equal basis than I did with other supervisors. In fact, it's the first time that I've felt this way. I've always felt really subservient to the people that I worked for, whether it was true or not Maybe it's just getting older and maturing that had done that.

Several other individuals, who formerly saw themselves as novices taking advice, spoke of this equality as a matter of being able to influence the other person in work-related or technical matters. Others describe a flexibility of roles; they say they can be the giver of advice at one time and the recipient another time; at one moment, the supporter and at another moment, the

person in need of professional or personal support. Peer relationships at this stage seemed especially malleable and the individuals especially receptive to differences in day-to-day needs.

Dominant themes in middle career. During the 40s and early 50s, people in our sample appeared to be concerned with reworking old issues or learning new ways to approach situations in life and career through their relationships (Hall, 1976; Hall & Kram, 1981; Levinson et al., 1978). Individuals in middle career have substantial histories established, histories shaped by the choices made and passed up, situations dealt with effectively or ineffectively. Midcareer is known to be a time for re-evaluation and rethinking of those choices and events. Midcareer is also a time when individuals increasingly depend on others to help them accomplish the tasks of the organization.

These developmental tasks appear to shape the dominant themes for peer relationships in this career stage (see Table 4). Thus, a collegial peer relationship, by providing career strategizing and job-related feedback can help individuals learn how to develop subordinates and how to effectively depend on, as well as to coach, junior colleagues. Similarly, a special peer relationship, in providing several psychosocial functions, might offer a way to manage fears of obsolescence and processes of reassessment and redirection that tend to occur at some time during this period.

The social processes in the relationships in middle career years, particularly in collegial peer and special peer relationships, seemed somewhat reminiscent of mentors' views of mentoring relationships (Kram, 1983). In our research sample, peer relationships for individuals in this career stage were generally with younger people. Individuals in their 40's and early 50's seemed to get a chance to see a younger peer dealing with the issues and choices they themselves had experienced at earlier stages in development. The other peers seemed to live out vicariously alternative ways of confronting and solving those issues and concerns:

I think I envy a lot of . . . some of her characteristics. She, I think, is more dedicated to her job, and to things than I am. The job, people, and principles. I could fluctuate. My interests can change. I would tend to do the thing that appeals to me more, and let something else slide. She's more organized, more on top of things . . . I think maybe too that she probably felt that she had seen my growth as a manager, and maybe she liked that and tried to follow through in those footsteps.

While the difference in age creates some of the dynamics reminiscent of a mentoring relationship, the similarity in level creates more of a two-way exchange and the mutuality characteristic of a peer relationship.

Dominant themes in late career. As individuals progress through life and enter late adulthood and career, peer relationships may take on a unique role, aiding the gradual movement into retirement. Individuals in late career begin to acquire an understanding and appreciation for the selves that have accomplished so much in life and in their careers (Levinson et al., 1978). In

terms of career development especially, most individuals are facing the reality of moving out of the work force and into new endeavors through retirement (Hall, 1976; Schein, 1978). The individual's own fallibility and vulnerability take on greater significance.

Dominant themes for peer relationships at this stage in our sample seemed to reflect the impending move out of the organization (see Table 4). Thus, information peers, in providing information, may do so with the implicit benefit of enabling an individual to stay connected enough with the organization to continue to work effectively. The collegial peer relationship and the special peer relationship, through the various functions that they provide, may become mechanisms that enable the individual to assume a more consultative role, to pass on major responsibilities to younger colleagues, and to prepare psychologically for retirement.

The special peer relationship in late career stood out in this research sample as both rare and very valuable. Few individuals can provide emotional support and confirmation to an individual in late career without their having had similarly long career histories. Thus, peers of the same age with similar organizational histories may offer unique opportunities for intimate sharing about immediate developmental tasks:

During the conversation, a lot of times it will come up, where do you think we can go from here, at our age . . . ? I think probably I could feel more comfortable with Ted talking about things that have happened, and making an analysis of it, and being able to both understand what's happened. I think that's pretty important because we can relate to each other much better than I could relate to Sara [who is a much younger peer]. First of all, she wouldn't know what the hell I'm talking about because unless you've experienced it, you really can't talk about it.

While participants relished and appreciated differences as sources of learning at this career stage, they appeared to find similarities to be great sources of security as they experienced the loneliness of anticipating movement out of their organizations and careers. Collegial peer and special peer relationships in late career provide, in some instances, a home away from home—a chance to be understood and liked by someone who has been through it all too.

IMPLICATIONS

As a result of this study, we have delineated a continuum of peer relationships and outlined the developmental functions provided by those relationships. Furthermore, we have suggested the manner in which those relationships may fulfill different individual needs at different career stages. This exploratory research has implications for individuals and for the direction of future research on adult relationships at work.

This study suggests that there are a variety of peer relationships — information peer, collegial peer, and special peer — that can support individual development of successive career stages. Each type of relationship offers a range of opportunities for growth through the distinctive functions it provides.

Some of these functions resemble those seen in mentoring relationships; at the same time, however, they tend to involve greater reciprocity and mutuality. The combination of various functions and types of relationships would seem to offer almost all individuals some means for growth and support at any time in their careers. This potential for meeting the needs of many people at every career stage truly makes peer relationships more universally available than conventional mentoring relationships and an exciting alternative to them.

Peers as Mentors

This study, in conjunction with previous studies of mentoring, indicates that mentoring and peer relationships have several common attributes. They both have the potential to support development at successive career stages. In addition, they both provide a range of career-enhancing and psychosocial functions, some of which are found in both kinds of relationships (see Table 2).

There are, however, several important differences between these two types of relationships. First, in conventional mentoring relationships there are significant differences in age and in hierarchical levels, while in peer relationships one of these attributes is usually the same for both individuals. Second, the clearest distinctions between mentoring and peer relationships are found in the functions provided and the quality of the exchange. While a few of the developmental functions of the two types of relationships overlap, mentoring relationships involve a one-way helping dynamic while peer relationships involve a two-way exchange. A comparison of the complementarity found in a mentoring relationship with the mutuality found in a peer relationship best summarizes this difference (see Table 2).

Previous research on managerial and professional careers has urged individuals to seek mentors (Halcomb, 1980; Missirian, 1982; Phillips-Jones, 1982; Roche, 1979; Schein, 1978). The current study suggests that peer relationships may offer unique developmental opportunities that should not be overlooked or underestimated. They provide a forum for mutual exchange in which an individual can achieve a sense of expertise, equality, and empathy that is frequently absent from traditional mentoring relationships. In addition, peer relationships appear to have a longevity that exceeds that of most mentoring relationships. Several of the peer relationships we studied had lasted almost 30 years. Thus, these relationships can provide continuity over the course of a career, seeing individuals through change and transition, as well as through the day-to-day tasks of work life.

For individuals who do not have or want mentors, peers seem essential (Shapiro, Hazeltine & Rowe, 1978). They can coach and counsel; they can provide critical information; and they can provide support in handling personal problems and attaining professional growth. Even those who have mentors may want to consider the unique possibilities found in relationships with peers. There may be times during an unfolding career, when it makes more sense to consult with a peer instead of a mentor. Indeed, the results of

this study and previous research on mentoring (Kram, 1980, 1983) suggest that the relative importance of relationships with mentors and peers may change over the course of a career. While conventional mentors are most important in early career, peers seem to be important at all stages. Further research is needed in order to identify the unique constellations of relationships that may exist at each career stage to support individuals' development.

Questions for Future Research

This research, taken in conjunction with research on mentoring, suggests a number of intriguing questions for further exploration. In reconstructing the histories of peer relationships, it became obvious that there were considerable shifts in some relationships over time and little change in others. Some of our relationships actually seemed to progress from left to right on the continuum; others did not. It seems important, therefore, to ask why one relationship grows into a special peer relationship, while another remains constant. A better grasp of the psychological and organizational factors which encourage or inhibit progress needs to be developed. Such insights would provide individuals with an increased understanding of their own peer relationships, and would enable organizations to create conditions that encourage the formation of supportive peer relationships among its members.

It will also be necessary to delineate how individual differences in developmental tasks, self concepts, and attitudes toward intimacy and authority, as well as other individual attributes, shape the nature of relationships that are needed and maintained. For example, individuals with a particular posture toward authority may well be more inclined to develop relationships with peers, and to find these kinds of relationships of greater value than hierarchical relationships. Or, individuals who feel in competition with peers for jobs or resources may be inhibited from forming a more intimate type of peer relationship. Increased understanding of how individual attributes shape the nature of peer relationships and relationship constellations will significantly add to our understanding of adult relationships at work.

Since we studied relationships in one organization, we forfeited the opportunity to examine how variations in the organizational setting affect the nature of peer relationships. Interview data, however, suggests that certain characteristics of the work environment, such as the number of years in the company, differences in the culture of the work group, nature of the reward system, nature of task design, and availability of training programs, may have affected the relationships that were studied. For example, a number of the relationships we studied began in job-orientation programs. Systematic research across organizations is needed to determine the extent to which relationships are affected by such features of an organization. We wonder especially about the effects companies quite different from this particular research site—for instance, fast growing, highly competitive firms with rapid turnover of technical professionals—might have on relationships. It would be useful to investigate how these vastly different conditions facilitate or inhibit the opportunities to develop supportive peer relationships.

This study has expanded our insights into the nature of peer relationships, and it has identified several new, potentially fruitful lines of research. The field of adult relationships is one that deserves greater attention. Investigation of relationships with peers, mentors, and subordinates at different career stages and in diverse organizational settings are preliminary steps toward a better understanding of adult relationships at work.

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BUSINESS STRATEGY AND THE MANAGEMENT OF PLATEAUED EMPLOYEES

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This study compared effective and ineffective plateaued salespersons in two companies having different business strategies in terms of their job histories, job satisfactions, perceived work environments, career stages, definitions of success, and career attitudes. The business strategy of the company had a significant effect on the incidence of plateauing and on the performance of the plateaued person.

In recent years, the phenomenon of career plateau has begun to receive some attention (Carnazza, Korman, Ference, & Stoner, 1981; Ference, Stoner, & Warren, 1977; Stoner, Ference, Warren & Christensen, 1980; Veiga, 1981; Warren, Ference, & Stoner, 1975). It is estimated that the number of people reaching plateaued career stages will increase throughout the 1980s because of the workforce's increasing dependence on older workers as fewer people enter it and the mandatory retirement age is extended (Hall, 1983). New workers, better trained and educated than previous generations, will believe themselves assured of excellent entry positions and continued upward mobility (Near, 1983). But, because of the pyramid shape of most organizations, lack of upward mobility will become a major problem for many employees. The broadest objective of this study was to determine which personal and organizational factors—including the firm's business strategy—are associated with performance for employees who are at various stages of career plateauing.

REVIEW OF CAREER PLATEAUING LITERATURE

A plateau has been defined as the point in a career when the likelihood of further hierarchical promotion is very low (Ference et al., 1977: 602). Thus, the point at which a worker becomes plateaued is the final step in that person's career. Some popular literature has described the plateaued performer in negative ways, but there is nothing inherently negative about the

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phenomenon. Although people are reluctant to admit to themselves, or to colleagues, family, and friends that they have achieved the highest level of their careers, most managers have subordinates who are plateaued. To say that a person has plateaued reveals little about the individual's performance on the job, what motivates this person, what organizational conditions enhance this person's performance, or any of a number of other factors. For some people, realizing that they have reached plateaus may lead to little dissatisfaction. For the organization, the fact that individuals may be plateaued and performing poorly is of obvious concern. A rising number of plateaued employees who are not performing well is likely to reduce organizational effectiveness and may create additional problems, such as low morale, claims for compensation, requests for transfers, etc. The personal and organizational dynamics of plateauing have received little attention to date. In the past, organizations have included positions that were designed to be occupied by plateaued employees; concern for greater productivity has caused many companies to rethink this approach.

Other than studies by Stoner, Ference, and colleagues (Carnazza et al., 1981; Ference et al., 1977; Stoner et al., 1980), and by Veiga (1981), Near (1983), and Evans and Gilbert (1984), little research has been conducted on the attitudes and motivations of plateaued personnel. Stoner, Ference, and colleagues offer a model for understanding the plateaued manager problem based on their in-depth study of 55 senior executives. The model delineates principal career stages of the plateauing process (see Figure 1). The model's two basic components are perceived likelihood of future promotion and current performance. As Figure 1 illustrates, they suggest four categories of workers. The "comers" are individuals who have been identified by the company as having high potential for advancement, but who are presently performing below their potential. The "stars" are doing outstanding work, have been promoted in the past, and are seen by management as having the potential for further advancement in the company. The "solid citizens" are individuals who are performing satisfactorily, but who, for organizational or personal reasons, or both, are seen as having little chance for advancement. The "deadwood" are individuals who have limited possibilities for advancement and who are performing below expected levels. There is no single sequence of career moves. That is, comers do not necessarily become stars, nor solid citizens deadwood.

Carnazza et al. (1981) empirically tested a portion of this model in their study of 376 middle and upper level managers from a company. The authors found that plateaued managers, when assigned challenging, satisfying and clearly defined jobs that they perceived as important to the company, continued to be able to maintain high performance standards. The less effective performers among plateaued managers tended to believe that promotions were based on reputation, personality, and educational background. One of the most interesting findings was that both the plateaued and nonplateaued managers saw promotion aspirations as important influences on their

FIGURE 1
A Model of Managerial Careers^a

Current Performance	Likelihood of Future Promotion	
	Low	High
High	Solid citizens (Effectively plateaued)	Stars (Nonplateaued)
Low	Deadwood (Ineffectively plateaued)	Comers (Nonplateaued)

^aFrom Ference et al. (1977: 603).

performance. Therefore, promotion aspirations did not differentiate between plateaued and nonplateaued managers.

Veiga (1981) studied the career histories and attitudes of 1,733 managers from three large manufacturing companies. Using the Ference et al. career classification in Figure 1, he contrasted the job histories and attitudes of plateaued—both solid citizens and deadwood—with nonplateaued managers. He found that deadwood were more prone to change companies than either the solid citizen or the nonplateaued managers. He also found that the deadwood managers moved into plateaued organizational positions as early as their third move. That is, these individuals moved into positions that their predecessors had had for a long time, and when these people moved, it was not for reasons of upward mobility. Their positions gave them little opportunity to engage in projects visible to top management. In terms of their career attitudes, the plateaued managers believed that their services were less marketable to other companies than did nonplateaued managers, and they were less satisfied with their career advancement than the nonplateaued managers. Deadwood managers reported the lowest levels of visibility and exposure to senior management, and the greatest fear of career stagnation.

Near (1983) studied the attitudes and behaviors of 199 managers from a variety of companies. She found that plateaued managers had little inclination for advancement, suffered poorer health, lacked education, and were less satisfied with their superiors than nonplateaued managers. Plateaued employees were older and had longer tenure in their jobs than did nonplateaued employees.

Evans and Gilbert (1984) studied the need satisfactions and performance-reward expectancies of 52 managers in one company. They defined employees as plateaued if they were moving slowly through different jobs at the same hierarchical level as well as moving more slowly through the hierarchical ranks than others. Using these criteria, 30 employees were plateaued and 22 were nonplateaued. These authors found no difference between the need satisfactions, based on Maslow's need hierarchy, of plateaued and nonplateaued managers. Age had a more salient influence on need satisfactions than career state. Older employees, regardless of their career state, were less satisfied

with their pay, future benefits, and future advancement in the organization than younger employees. Career state did not affect performance-reward expectancies.

Based on the model presented by Ference et al. (1977) and on the few empirical studies cited above, we expect that:

Hypothesis 1: Plateaued employees will have (a) fewer job changes and (b) longer average job tenure than non-plateaued employees.

Hypothesis 2: Nonplateaued employees will be more satisfied with their jobs than plateaued employees.

Hypothesis 3: Plateaued employees will be more concerned with maintenance and disengagement career stage issues, whereas nonplateaued employees will be more concerned with exploration and establishment stage issues.

Hypothesis 4: Plateaued employees will describe their work environments differently from nonplateaued employees. Specifically, nonplateaued employees will describe their supervisors in more positive terms, have a clearer understanding of the performance-reward relationship, participate in more decisions, feel less pressure to produce, and have greater upward influence with senior managers than plateaued employees.

Hypothesis 5: Plateaued employees will describe their jobs as possessing less challenge, involvement, and opportunities for success than will nonplateaued employees.

Hypothesis 6: Plateaued employees will have less marketability, lower propensity to leave, and lower promotional aspirations than nonplateaued employees.

Hypothesis 7: Plateaued employees will place greater emphasis on personal success and less emphasis on company and professional success than nonplateaued employees.

BUSINESS STRATEGY AND CAREER PLATEAURING

One of the problems with the research undertaken by Stoner, Ference, and colleagues and by Veiga, Near, and Evans and Gilbert has been their failure to take into account the business strategy of the firms in which subjects were employed. London and Stumpf (1982) state that careers develop in different ways depending on the industry and the strategy adopted by the firm. This statement has not been challenged. The business strategy of a firm focuses on how the organization aligns itself with its environment. Strategy

affects the internal structure, processes, goals, and the roles of various functional departments in the firm. It is beyond the scope of this manuscript to fully develop how alignment takes place and the various strategies that a firm may adopt to reach this goal. We applied the typology developed by Miles and Snow (1978), which appears to have promise as a means of analyzing firms with a single class of products. (For reviews of this typology, see Hambrick, 1983a; Meyer, 1982; Snow and Hrebiniak, 1980.) Using the rate at which the organization changed its products and markets and how it responded to its environment as criteria, we classified one firm as an analyzer and the other as a defender.

The firms competing in the defender's industry have relatively entrenched competitive positions. The defender firm in our sample was in an industry that actually saw a 5.6 percent decline in sales during the period of this study. A firm could only improve its sales performance by taking market share away from another firm. According to Porter (1980), firms competing in such an environment usually gain market shares through intense price competition. Reliable delivery times, creative credit policies, and other business tactics designed to remove the defender from straight price competition might also be used to increase market share.

According to Miles and Snow, defender organizations engage in little product/market development and have narrow product/market domains. Top managers in this type of organization are highly trained in their organization's limited area of operation, but tend not to search outside of their domains for new products. As a result of their narrow focus, managers devote primary attention to improving the efficiency of their existing operations. The functional areas of finance and production play dominant roles in the decision making process, whereas marketing and sales play lesser roles in the strategic decisions facing the firm. The organization's ideology is "lean and hungry," and the shared values are efficiency, predictability, and self-reliance.

The analyzer firm in our sample also competed in a mature industrial products industry, but was able to add some new products in high growth segments of the market. The growth rate for this industry was 2.5 percent. The analyzer firm was less committed to market stability and efficiently competing in one small niche than the defender. Therefore, the analyzer operated in two types of markets: one stable and the other changing. The organization was structured along divisional lines. In its stable markets, it acted like a defender. Production and finance functional departments had dominant roles in shaping the firm's competitive responses to these markets. In its changing markets, it competed by stimulating demand and creating new market opportunities. This initiative was supported with relatively heavy marketing expenditures. R&D, marketing, and sales departments had major inputs into the firm's strategic business decisions. The organization ideology was the "corporate system," and its shared values were represented by cybernetic controls linking organizational subcultures.

The second aim of our study was to explore the relative incidence of plateauing in firms that have adopted different business strategies towards

their environments. If defenders operate in slow growth industries with little new product introduction, their sales and marketing personnel are not likely to have many avenues for upward mobility within the firm. The dominant strategic issues concern finance and production. Personnel in these functional areas are more likely than others to gain visibility and exposure to senior management because they can cope with the critical contingencies (e.g., low prices, inexpensive raw materials, service, quality) confronting the firm. But since analyzers require superior market intelligence, in those firms marketing and sales personnel would achieve high visibility to senior management and enhance their promotability. Therefore, we propose that:

Hypothesis 8: Defender firms will have a greater incidence of plateaued sales employees than will analyzer firms.

METHODS

Subjects and Companies

A total of 499 salespersons from two companies volunteered to participate in this study. Although the two companies have different standard industrial classification codes, they both sell industrial products that are primarily in the maturation or decline stages of the product life cycle. The products and services they offer are familiar to the customers. These companies face high instability in derived demand and sell products that might be classified as roller-coaster commodities (Hambrick, 1983b).

The career opportunities for salespeople in these two companies are quite similar. Sales is an entry level position for which either experienced or inexperienced salespeople may be hired. The sales force is the most important component of each firm's promotional mix. It is very important that salespeople establish close interpersonal relationships with their customers. As a result, new people generally stay in their initial territory assignments for extended periods of time. Compensation policies enable salespeople to have successful careers by remaining in field sales. Promotions are almost always to management positions in the sales area. However, the pyramid shape of sales management limits promotion opportunities as persons progress to higher management levels.

To capture the strategic position of each firm, one of the researchers interviewed its top manager, who also completed a questionnaire. We established a strategic profile for each firm from these sources of data. Interviews with salespersons and sales managers confirmed the data. The sales force for the defender firm numbered 285 people; they generated \$129,500,000 in annual sales volume. This firm's market share was 25 percent. (The largest four firms in this industry commanded an 80 percent share of the total market.) The annual sales volume for the analyzer company exceeded \$130,000,000; it had 299 salespeople, and a market share of approximately 15 percent. (The largest four firms in this industry commanded a 40 percent share of the total market.) The response rate for completed data on salespersons for the defender

TABLE 1
Means of Demographic Factors for Salespersons by Company Strategy

Demographic Factor	Defender Firm <i>n</i> = 238	Analyzer Firm <i>n</i> = 261
Household income	\$26,500 ^a	\$20,000 ^a
Percent of income earned from sales job	80.68	79.85
Marital status: married	84%	81%
not married	16%	19%
Age	44	40
Race: white	98%	97%
black	2%	3%
Gender: male	98%	98%
female	2%	2%
Highest educational level:		
completed high school	34%	27%
attended college	35%	32%
college graduate	31%	41%
Number of dependent children	1.6	1.4
Percent of spouses who work:		
not employed	32%	40%
part-time	24%	23%
full-time	44%	37%

^aRange = \$15,000 - \$75,000.

firm was 84 percent (*n* = 238), and for the analyzer firm it was 87.7 percent (*n* = 261). The means of salient demographic factors are presented in Table 1. These data indicate that the samples are quite similar, except in terms of income.

Measurement Instruments

Each salesperson completed a 20-page survey instrument that measured the constructs stated in the hypotheses.

Job history. All salespersons provided complete job histories ranging from the beginnings of their careers through the present. The history included the length of time in each position, the direction of each move—upward (increased responsibility), lateral (same level of responsibility) or downward (a decrease in job responsibility)—and the type of movement (changed company, transfer, or new position at same location).

Job attitudes. The three concepts measured within this construct were developed by Hall and his associates. Job involvement ($\alpha = .79$) was assessed by a 4-item Likert scale developed by Hall, Goodale, Rabinowitz, and Morgan (1978). This scale taps the extent to which the person is psychologically identified with a job (e.g., "eats, sleeps and lives" the job). Psychological success ($\alpha = .83$) was measured by the 6-item scale developed by Hall and his colleagues. It measures the person's feelings of competence and success on the job (e.g., "I have not been especially proud of my performance lately.") in

terms of internal standards. Job challenge ($\alpha = .78$), developed by Hall and Lawler (1970), measures the extent to which a person describes a job as challenging and as utilizing skills (e.g., "My job gives me the opportunity to learn new skills and techniques," "I have challenging work").

Work environment. Newman (1977) and Joyce and Slocum (1984), among others, have argued that immediate work environment is one factor that influences a person's job performance. This multidimensional construct was measured by five scales. Newman (1977) developed the first four and the researchers for this study developed the fifth.

Supervisory style: The extent to which the supervisor is described as open, supportive and considerate of subordinates' needs ($\alpha = .92$; 5 items).

Performance-reward system: The extent to which rewards, such as promotions, and salary increases, are based on performance rather than on other considerations, such as favoritism, seniority, and politics ($\alpha = .74$; 5 items).

Decision making: The extent to which the employees take part in decisions that affect their work situation ($\alpha = .65$; 4 items).

Pressure to produce: The extent to which management exerts pressure on employees to produce ($\alpha = .57$; 5 items).

Power and visibility: The extent to which employees are assigned to projects and committees that get the attention of senior management ($\alpha = .72$; 5 items).

Job satisfaction: Job satisfaction was measured by the scales from the Job Descriptive Index developed by Smith, Kendall and Hulin (1969). The reliability and validity of the JDI is well-established in the literature. The five JDI scales used and their internal consistency reliabilities are: supervisor ($\alpha = .87$); pay ($\alpha = .69$); promotion ($\alpha = .88$); co-workers ($\alpha = .87$); and work ($\alpha = .87$).

Career stages. To measure the career stage of the salesperson, Super, Zelkowitz, and Thompson's (1981) instrument was used. Super (1957) proposed that most individuals pass through four distinct career phases. As others have described these phases (see Baird & Kram, 1983), we will only briefly summarize them here. We used the Career Development Inventory Adult Form composed of 15 items (on a 5-point response scale) to measure each of the four career stages. These stages and the behaviors associated with each are:

Exploration: The individual's central concern is developing ideas about a field. The focus is more on making a commitment to a general occupational choice than to a specific job. This stage usually occurs when people are in their early 20s ($\alpha = .88$).

Establishment: Individuals are concerned with getting established in jobs by which they can support their families, use their abilities, and express their interests. Getting more firmly established in an occupation and a job is central. A person is likely to be considering conflicts between work and family pressures ($\alpha = .85$).

Maintenance: The focus here is on maintaining an established position, despite competition from others. Individuals are also concerned with catching up with new developments in their

fields or with doing something different from what they have done in the past ($\alpha = .84$).

Disengagement: Individuals are in the process of "letting up" as they get older, tapering off before retirement to avoid the shock of sudden loss of occupational activity. The focus is on adjusting to a new role, that of leisured person ($\alpha = .86$).

Since age and career stage could be confounded, we ran ANOVA's to check. These analyses indicated that career stage did vary by age (defender company: $F = 11.90$; $p < .01$; analyzer company: $F = 9.55$; $p < .01$.) In both companies, salespersons in the exploration stage were significantly younger than those in the disengagement stage of their careers. No differences in age were obtained for salespersons in the establishment and maintenance stages of their careers. The omega squared (ω^2) for age and career stage was only 12 percent for the analyzer company and 16 percent for the defender company. Therefore, while there are age differences among individuals in the four career stages, other factors significantly affect career stage to a greater extent than does age.

Performance. We asked immediate supervisors of each salesperson to provide us with the actual sales volume for each salesperson during the previous 12 months. To check on the construct validity of this figure as an indicator of each salesperson's performance, we asked supervisors to evaluate the salespersons in their territories on seven key sales dimensions, dimensions which Stanton and Buskirk (1983) found are typically used to measure a salesperson's performance. These seven dimensions, measured with Likert 5-point scales, were: sales volume, new account development, full-line selling results, leadership ability, planning, initiative, and resourcefulness. We constructed a summated index of these seven dimensions for each salesperson ($\alpha = .88$ for the defender, and $\alpha = .90$ for the analyzer company). The bivariate correlations between last year's sales volume and the superior's performance ratings were .31 ($p < .01$) and .47 ($p < .01$), respectively, for the defender's and analyzer's salespersons, providing support for the construct validity of sales volume as a measure of performance.

Definition of success. According to Carnazza et al. (1981), Stoner et al. (1980), and Hall (1983), individuals in different stages of plateauing define what constitutes success differently. To measure success, we asked Hall's 15 Likert-type questions (7-point scales), and factor-analyzed these scales using the principal-factor method. A three factor orthogonal solution was selected as most interpretable and explained 58 percent of the common variance. The first factor, labelled in-company success (eigenvalue 3.29; 33% explained variance; $\alpha = .72$), loaded most heavily on four questions related to salary, record achieved at work, upward movement in the company, and attaining employment security—variables associated with success in a specific company. The second factor, labelled professional success (eigenvalue 1.46; 14.7% explained variance; $\alpha = .83$), loaded heavily on three questions related to status in the profession, attaining goals that the person set, self-fulfillment, and growth in professional life. These were not company specific. The third

category, labelled personal success (eigenvalue 1.02; 10.2% explained variance; $\alpha = .78$) had five questions that focused on the achievements of respondents' children, self-understanding, time spent with family, and status achieved in the nonwork community. These items refer to success in activities unrelated to work.¹

Measures of career attitudes. These questions were taken from Veiga's (1981) study. Marketability was determined by asking salespersons to rate their chances of obtaining a position as good as their present one in another company on a scale ranging from 0 (no chance) to 100 percent (excellent chance). They were also asked to indicate if they would be willing to relocate if a promotion required it on a scale from 1 (very unlikely) to 7 (very likely). We determined propensity to leave by asking employees to rate their willingness to leave for a better job in another company on a 5-point scale ranging from 1 (would not move) to 5 (would definitely move). Promotional aspiration was determined by asking employees to rate their desire for promotion from 1 (definitely wanted to get promoted) to 7 (not really). The final question asked them to rate when they wanted to be promoted from 1 (immediately) to 6 (never).²

ANALYSIS

The first issue we had to address before proceeding to the main research questions was the definition of a plateaued salesperson. Although there is no hard evidence establishing when plateauing occurs (Carnazza et al., 1981; Evans & Gilbert, 1984; Hall, 1983; Veiga, 1981), in the sales field most managers agreed that job change, not age, was the salient variable. Using this information as a guideline, we decided to classify salespersons as plateaued if they had not been promoted or had a lateral job change in five years or more. To assess the validity of our classification scheme, each salesperson's immediate supervisor was asked to rate, on a Likert scale, "What's the probability of 'X' getting promoted in the next few years?" Using an ANOVA design, we examined this score by job change. At five years, significant differences ($F = 37.41$; $p < .01$ and $F = 39.01$; $p < .01$ for the analyzer and defender firms, respectively) were obtained. Those salespersons who were not promoted after five years have less chance to get promoted than those who had a job change in the last five years. The significant relationship between the time since last change (job tenure) and probability of promotion strongly support the five year criteria as appropriate for separating plateaued from nonplateaued performers in both firms. Following the model constructed by Ference et al. (1977), we further subdivided the plateaued sample into deadwood (low performers who were plateaued) and solid citizen (high performing plateaued) groups. The nonplateaued salespersons were divided into stars (high performing) and comers (low performing) groups. Performance

¹The factor loadings are available upon request from the first author.

²Intercorrelation matrices are available upon request from the first author.

figures for both stars and solid citizens were in the upper halves of performance distributions in their companies, while performance figures for both comers and deadwood fell in the lower halves.

We used multivariate analysis of variance to test for differences among Stoner's et al. (1980) classifications. Our central concern was to look for the main effects of being at a particular stage of plateauing on attitudes and behavior. When the MANOVA was significant, we conducted univariate *F* tests.

RESULTS

We compared the strategies of the two businesses to determine the relative incidence of plateaued and nonplateaued salespersons. Results indicate that there are significantly more plateaued salespersons employed in the defender company than in the analyzer company ($\chi^2 = 42.3$; $p < .01$), supporting Hypothesis 8. This difference could be the consequence of a variety of factors, including (1) more opportunities for vertical mobility in the analyzer company, (2) higher frequency of personnel turnover in the analyzer company, and (3) different performance criteria in the two companies.

These factors may be related to the analyzer firm's market growth and the attractiveness of the industry. The development of new products leads to new sales opportunities and thus presents avenues for upward mobility for selected members of the sales force. As the firm expands into new territories, lateral transfers are more likely to occur. The defender company does not seek new products or new market opportunities, but tries to gain efficiency through high employee productivity and low direct costs. Salespersons are not so prominent as members of the dominant coalition as production and finance personnel are.

Since the analyzer company is adding new products, it is in a better position to attract high performing salespersons by promising upward mobility. Turnover of sales personnel may well be higher because of the more demanding performance criteria the company requires to maintain its competitive position within its industry. An analysis within the plateaued category between the analyzer and defender companies supported this point. The analyzer firm had a much greater proportion ($\chi^2 = 6.36$; $p < .01$) of high performing plateaued salespeople than did the defender company.

Data we gathered from senior management in each firm showed that the defender firm's senior management ranked "improving the quality of working life" tenth out of ten goals and ranked the personnel and marketing functions as "not very important to the success of the firm." For them, the most important function was production, followed by finance and quality control. In the analyzer firm, the quality of working life was ranked second and the importance of the marketing function was very high. The philosophies of the senior people in each company probably generated different performance expectations for plateaued salespersons in each firm.

We next addressed the issues raised by Stoner et al. (1980), Veiga (1981), Near (1983), and Evans and Gilbert (1984) in their studies. These researchers

found that attitudes and goal aspirations differed according to employees' stage in the plateauing process. Since our research had established that the company's business strategy affected the incidence of plateauing, we performed separate analyses within each company.

Defender Firm

The means for employees' job histories, facets of satisfaction, characteristics of their jobs, etc. are presented in Table 2 for the defender firm. Plateaued employees had greater job tenure than nonplateaued employees, supporting Hypothesis 1a. There was no difference between the total number of job moves or the number of different employers for the plateaued and nonplateaued people, rejecting Hypothesis 1b.

There was a significant difference between the plateaued and nonplateaued salespersons' levels of job satisfaction, but in a direction opposite from what we had hypothesized. Plateaued employees were more satisfied with their immediate supervisors ($F = 3.40$; $p < .01$), and work itself ($F = 3.56$; $p < .01$), than nonplateaued employees. One possible explanation for these results is that, since the plateaued employees have lower aspirations for promotion ($F = 18.50$; $p < .01$), they have accepted their present roles in their organizations. They have gotten off the tournament mobility track and no longer seek advancement within the firm. This withdrawal from the mobility tournament (Rosenbaum, 1979), either because of low levels of aspiration or anticipation of failure, has not been accompanied by any strong pressures to produce from their immediate supervisors. These employees have probably redefined their roles within their companies and are satisfied.

We also hypothesized (Hypothesis 7) that plateaued employees would place greater emphasis on personal success and less emphasis on in-company and professional success than the nonplateaued employees. Although there were significant differences among the groups in their definition of success ($F = 2.41$; $p < .01$), the hypothesis did not receive support. The stars and solid citizens considered professional success more important than did the deadwood ($F = 4.46$; $p < .01$). The pattern for in-company success was similar, but differences were not significant.

Extending Veiga's (1981) analysis, we compared the deadwood and the stars. The stars stayed in jobs for much shorter periods of time—34 months compared to 56 months—and were in the establishment, rather than the maintenance, stage of their careers. At this career stage, employees should know the ropes of their organizations and be most concerned with exposure and advancement through continued high performance. While still needing close supervision, stars indicated that they were not satisfied with their immediate supervisors' styles, nor with the work supervisors assigned to them. Learning how to operate under these conditions is a major psychological adjustment for stars. Thus, while getting coaching and gaining visibility to senior management are important, their immediate supervisors might not be appropriate mentors.

Differences between the comers and the plateaued salespeople are pronounced. The comers' job histories are quite different from those of the plateaued salespersons—especially as to average tenure, and the number of moves—and their levels of satisfaction with their work and supervisors are also quite different. The comers are not satisfied with their work. This is manifested in their lack of job involvement and the few psychological successes they experience on the job. We found major differences between the comers and the plateaued people in their career stage. The comers are in the establishment stage of their careers and are most concerned about balancing appropriate levels of commitment to work and to the family. They are not investing energies in helping and developing less experienced subordinates—a role played by the solid citizens.

Career attitudes were significantly different ($F = 3.87$; $p < .001$) among the four groups of employees (see Table 2). These results are very similar to those obtained by Veiga (1981: 573). On marketability, there were no differences between the plateaued and nonplateaued managers. All employees believed that they had relatively good chances of obtaining similar positions in other companies. There were significant differences in the other four career attitudes as hypothesized. Plateaued employees, compared to the nonplateaued, indicated that they were not likely to leave their company for better jobs in other companies ($F = 6.20$; $p < .01$), would not relocate for a promotion in their present company ($F = 15.22$; $p < .01$), were not sure that they wanted to get promoted ($F = 18.50$; $p < .01$), and if they wanted to get promoted, had a much longer time frame for promotion (greater than five years from the present compared to within the next year) than did the nonplateaued employees ($F = 7.10$; $p < .01$).

In summary, the attitudes and job performances of plateaued and nonplateaued employees in the defender company were differentiated in terms of the following factors: job history, job attitudes, work environment, job satisfaction, career stage, definition of success, and career-related attitudes. The data from this company replicate and extend the earlier findings of Stoner et al. (1980) and Veiga (1981).

Analyzer Firm

Table 3 presents data on the attitudes of the plateaued and nonplateaued salespersons in the analyzer firm. The job histories of these two groups were differentiated mainly in terms of average tenure on the job ($F = 30.91$; $p < .01$). Also, on the average, plateaued employees were older and had longer tenure in their jobs than did the nonplateaued employees. The solid citizens had the longest job tenure and were the oldest group of employees. There was no difference in the average number of moves measure, rejecting Hypothesis 1a.

The results indicate no differences in job satisfaction, career stage, or definition of success between the plateaued and nonplateaued employees. There were significant differences between these groups in terms of job

TABLE 2 (continued)

Dimension	Nonplateaued		Plateaued		Univariate F-value	Contrasts ^a
	Stars (n = 37)	Comers (n = 45)	Solid Citizens (n = 74)	Deadwood (n = 82)		
Career stages^c						
Exploration	3.35	3.35	3.95	4.02	9.91**	ST,C:SC,D
Establishment	3.02	2.99	3.30	3.34	6.32*	ST,C:SC,D
Maintenance	2.83	2.95	3.09	3.32	5.04*	ST:D
Disengagement	2.24	2.02	2.25	2.36	1.86	
Multivariate $F = 3.48$; $p < .01$. ^b						
Definition of success						
In-company	23.27	22.62	22.46	21.87	1.89	
Professional	18.89	18.32	18.73	17.60	4.46**	ST,SC:D
Personal	29.51	29.48	29.81	29.63	.09	
Multivariate $F = 2.41$; $p < .01$. ^b						
Career attitudes						
Marketability	4.26	4.19	4.42	4.26	0.65	
Propensity to leave	2.21	2.43	1.82	1.61	6.20*	ST,C:SC,D
Relocation	5.15	5.32	3.52	3.26	15.22**	ST,C:SC,D
Promotional aspiration	2.60	2.28	4.06	4.32	18.50**	ST,C:SC,D
Time of promotion	3.52	3.13	4.41	4.06	7.10*	{ST:D C:SC,D}
Multivariate $F = 3.87$; $p < .001$. ^b						

^aUsing Scheffé, the contrasts can be interpreted as follows at $\alpha = .05$:

C,ST:SC,D = Comer and star means are significantly different from the solid citizen and deadwood means.

C:SC = Comer mean is significantly different from the solid citizen mean.

ST:SC,D = Star mean is significantly different from the solid citizen and deadwood means.

^bDetermined by MANOVA.

^cThe closer the mean value is to 3, the greater its importance. A value of 1 indicates the person has not considered it, and a value of 5 indicates the person no longer considers it important to his/her career.

* $p < .05$

** $p < .01$

TABLE 3 (continued)

Dimension	Nonplateaued		Plateaued		Univariate F-value	Contrasts ^a
	Stars (n = 61)	Comers (n = 132)	Solid Citizens (n = 49)	Deadwood (n = 19)		
Career stages^c						
Exploration	2.58	2.48	2.56	2.98		
Establishment	3.33	3.07	3.24	3.34		
Maintenance	3.06	2.97	3.07	3.22		
Disengagement	2.58	2.45	2.57	2.98		
Multivariate F = 1.23; p < n.s. ^b						
Definition of success						
In-company	22.69	22.09	22.61	22.46		
Professional	18.31	18.39	18.17	18.15		
Personal	29.67	29.57	29.74	28.89		
Multivariate F = .52; p < n.s. ^b						
Career attitudes						
Marketability	4.30	4.12	4.34	3.84	1.71	{D:ST,C SC:ST
Propensity to leave	3.75	3.44	2.92	2.47	3.44*	D:SC,ST,C
Relocation	3.55	3.86	3.50	2.73	4.46*	ST,C:SC,D
Promotional aspiration	3.70	3.51	4.05	4.59	5.71**	ST,C:SC,D
Time of promotion	4.23	4.22	4.42	4.90	3.79*	ST,C:SC,D
Multivariate F = 1.72; p < .004. ^b						

^aSee Table 2 for interpretation.^bDetermined by MANOVA.^cSee Table 2 for interpretation.

*p < .05

**p < .01

attitudes ($F = 4.63$; $p < .05$), how these employees described their immediate work environment ($F = 2.25$; $p < .04$) and their career attitudes ($F = 1.72$; $p < .01$). The comers were less involved in their jobs and had less visibility to and influence with senior managers than did others. A review in the power literature (Kanter, 1979) implies that those managers who can establish lines of support and information to senior management are more likely to be promoted than those who lack visibility to these managerial elites. In this firm, there were no differences among the stars, solid citizens, and deadwood on this dimension. Only the comers indicated that they had not established modes of visibility to senior management and that they were not highly involved in their jobs. Since comers are also in the establishment stage of their careers, it is their supervisor's job to provide coaching and exposure to senior managers.

Significant differences were found in the career attitudes of the plateaued and nonplateaued employees as hypothesized. The nonplateaued employees were more likely to leave the company ($F = 3.44$; $p < .05$), geographically relocate if it meant a promotion within the firm ($F = 4.46$; $p < .05$), aspire to get promoted ($F = 5.71$; $p < .01$) and desire a promotion within the next few years ($F = 3.79$; $p < .05$) than the plateaued managers. The deadwood were less prone to leave the company than the stars or comers and less likely to relocate geographically—even if it meant a promotion—than all others. All employees believed that they could find other positions with similar companies if they were required to do so.

DISCUSSION

In this study, we tried to examine, within a multivariate framework, how plateauing affects various attitudes and behaviors of employees in firms that pursue different business strategies. Several important findings emerged. However, there are several reasons why these results should be interpreted with caution. First, there are differences in sample size among the four career states (stars, comers, solid citizens, and deadwood) that could lead to an overstatement of the results, especially for persons in the deadwood category in the analyzer company. Second, the interrelationships among the various dimensions (e.g., job history, job attitudes, work environment, etc.) and their linkages to career plateauing are not yet completely understood. Third, our sample did not include companies having business strategies other than defender or analyzer; thus, we could not fully explore all of the possible differences in the management of plateaued and nonplateaued employees. Lastly, we only had data from one firm pursuing each of the two strategies.

Initially, we found that firms adopting different business strategies adopted different human resources philosophies. The defender firm operated in a business environment that provided it with little opportunity for growth either internally or by diversification. While any notion of causality implied between this strategy and plateauing must remain tentative until

future studies confirm these findings, there was a greater incidence of plateauing in this firm than in the firm that had chosen an analyzer strategy. Not only was there a greater incidence of plateauing, but there were significant differences between the performance levels of the plateaued people in the two firms. The defender company had a greater proportion of its employees categorized as deadwood than did the analyzer company. We offered some explanations for these findings.

As hypothesized, there were major differences between plateaued and nonplateaued managers' job histories, job attitudes, career stages, career attitudes, and job satisfactions. While these results varied by company, there were also some important similarities. The solid citizens were the least likely to change companies or jobs. They had the longest average job tenure, were not likely to leave the firm or relocate, and had gotten off the tournament mobility track. This suggests that they had adopted a traditional orientation toward their careers that emphasized seniority in one company.

Contrary to the literature on mobile managers (Veiga, 1983), our data for the defender firm indicated that ineffective plateaued employees showed a greater tendency to move than did comers and solid citizens, but moved at the same rate as stars. In the defender firm, both the stars and deadwood moved more frequently than the comers and solid citizens ($F = 3.7$; $p < .05$). Further analysis of these moves indicated the types (e.g., foreman to salesperson) of moves were similar (53% and 55% upward moves, and 28% and 16% downward moves, respectively). In the analyzer firm, while there was no difference in the number of moves between the stars and deadwood, the stars had more upward moves than the deadwood (56% compared to 45%), and fewer downward moves (14% compared to 24%). Although our empirical support for these relationships is tenuous, these data suggest interesting questions for future research. In particular, future research that attempts to assign differential mobility opportunities to employees based on their prior number and types of moves, and that assesses the impact of those differential probabilities on employee turnover and performance data would be helpful.

The comers in both companies were in the establishment stage of their careers. These people have demonstrated their ability to move within the organization and continue to be concerned about promotion and advancement within the company. They are not satisfied with their visibility to senior management and this could be one reason why they are not involved in their jobs. Their superiors should provide them with opportunities to get involved by creating situations that are challenging and ego-involving; superiors are not doing so in either company. If supervisors assigned challenging work to comers and offered them exposure and visibility to senior management, the comers' performance would improve and the way would be paved for their further advancement within their companies. Since the comers are young (33 and 34 years old), their bosses could greatly facilitate their career development by speaking highly of them to senior management and assigning them tasks that are both ego-involving and challenging. In the defender

company, the comers are not satisfied with their boss. Perhaps they attribute their failure to gain visibility and exposure to top management through their own job performance to their supervisors' inability to create the proper circumstances for this to occur.

As expected, the nonplateaued employees expressed greatest interest in upward mobility. Compared to the plateaued employees, they probably have (1) greater willingness to relocate for a promotion within the company or to leave the company for a better job with a competitor, (2) a shorter personal time frame within which they expect to get promoted, and (3) a stronger desire to get promoted. In all likelihood, continued career movement and willingness to play the tournament mobility game bolster their confidence.

Out of all the sources of job satisfaction investigated, there were only two sources that differentiated plateaued and nonplateaued performers. In both instances, it was the comers in the defender firm that expressed dissatisfaction with their immediate supervisor and with the work itself. The lack of consistent differences in satisfactions between plateaued and nonplateaued performers was surprising in the light of the research by Stoner et al. (1980), but supported Veiga's (1981) findings. Given that the plateaued employees, especially in the defender firm, are in the maintenance stage of their careers, one might not expect them to express a high propensity to leave the firm. The comparable levels of job satisfaction and how they define success indicate that they have found niches.

In conclusion, additional research is needed to understand more fully how the strategy of the firm affects the management of plateaued and nonplateaued performers. In particular, it will be necessary to replicate these findings in other firms who have adopted similar strategic responses to their environments. Second, additional attitudinal factors that might serve to differentiate effective and ineffective plateaued and nonplateaued employees need to be investigated. Some of those might include career impatience, stagnation, and mobility patterns. Third, a longitudinal study designed to track people over time would provide insights into when and how they choose certain career alternatives. Fourth, individuals and organizations should devise strategies for managing the different career issues that occur in each plateau state. For the solid citizen, strategies might include a job change, getting professional counseling, or perhaps becoming a mentor to someone in the exploration or establishment career stages (Kram, 1983). For deadwood, management strategies might include termination, demotion, or early retirement; or offering them educational programs. Fifth, how does the composition of a sales force affect the assignment process? That is, are the stars and comers assigned to products and territories that enable them to succeed in the mobility tournament, while solid citizens and deadwood are assigned to unattractive products and territories that offer little opportunity for growth?

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DIVERSIFICATION STRATEGIES AND MANAGERIAL REWARDS: AN EMPIRICAL STUDY

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This study examined the relationship between diversification and the design of managerial reward systems in 20 large industrial firms. Interviews with 89 compensation specialists, strategic planners, and line managers provided data on performance issues such as performance definition, evaluation, and feedback, and formal rewards including bonus, salary, stock, perquisites, and promotion. Three clusters of firms were identified, each characterized by a distinctive reward system. Analysis indicated that type of diversification and pattern of linkage did not explain cluster composition. However, the distinction between steady-state and evolutionary processes did explain the composition in two of three clusters. It was concluded that the process by which diversification had been achieved was a greater influence on the design of managerial reward systems than was the cumulative extent of diversification at a given point in time.

The managerial reward system is an essential integrating mechanism through which the efforts of individuals are directed toward an organization's strategic objectives. Despite the apparent importance of maintaining congruence between corporate strategies and managerial rewards, surprisingly little research has investigated the design of reward systems. An extensive literature exists on rewards in the areas of reinforcement, behavior modification, and motivation theory (Herzberg, 1966; Kazdin, 1975; Skinner, 1969), but little theoretical or empirical work has been done that could serve as a guide in designing reward systems that are aligned with organizational strategy and structure. In the absence of a comprehensive body of theory and research, the purpose of this study is to examine the extent to which managerial reward systems reflect variations in corporate strategy, and to identify major strategic factors that influence reward system design.

LITERATURE OVERVIEW

Studies of corporate management in conglomerates and large diversified firms have suggested that differences in the design of reward systems may be traceable to differences in the level of autonomy granted to divisions in these organizations (Berg, 1969, 1973). Conglomerates tended to be more concerned than large diversified firms with maintaining an entrepreneurial

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atmosphere. They were found to provide clear incentives for independent action on the part of division managers in research and development, marketing, and production. These concerns were clearly expressed through the specification of performance criteria and the administration of a highly variable bonus component.

Lorsch and Allen (1973) noted several important differences between vertically integrated firms and conglomerates. First, the integrated firms associated a division manager's performance with the performance of the corporation as a whole; in the conglomerate, performance was based solely on division results. Conglomerate managers relied almost exclusively on quantitative financial performance indices, while managers in the integrated firms used qualitative and operating indicators as well. In addition, integrated firms arrived at bonus amounts for division managers through a subjective decision process, but conglomerate firms used an objective, formula-based process.

Similar results were found in a study that examined six firms that had diversified through internal expansion, and five firms that had diversified through acquisition of unrelated businesses (Pitts, 1974). In four of five acquisitive diversifiers, the division manager's bonus was based solely on the performance of the division. In all six internal diversifiers, the performance of the corporation was also considered. Calculation of the division manager's bonus was strictly objective (i.e., based solely on performance data) for most of the acquisitive firms, while in all six internal diversifiers, top management made significant subjective inputs in the bonus decision. Promotional patterns also varied by diversification strategy (Pitts, 1976). Managers in the acquisitive firms tended to have longer tenure in a single division, while those in the internally diversified companies moved more often and more widely within the company. The levels of autonomy enjoyed by divisions in each type of firm varied as well. In highly diversified firms, division managers tended to have highly autonomous relationships with each other and with corporate-level managers. In less diversified firms, these relationships were characterized by a greater degree of interdependence and interaction. These results suggest a fairly consistent relationship between certain aspects of the reward system and the firm's diversification strategy (i.e., internal vs. acquisitive diversification).

Salter (1973) attempted to integrate these findings and to present a prescriptive listing of important characteristics of reward systems. He identified corporate-division and interdivision relations as the aspects of organizational structure that bear on reward system design. According to Salter, reward system variables must remain congruent with the firm's structural configuration if the system is to contribute effectively to strategic objectives. System variables included emphasis on unit performance versus corporate performance, short-run versus long-run orientation of management, and the variability of rewards across subunits.

Conclusions from these studies may be summarized in terms of three major relationships. First, as firms become more diversified, there is an

increasing tendency to judge managerial performance solely in terms of quantitative, financial measures. Actual reward amounts tend to be tied to these measures through objective, formula-based mechanisms. Second, as firms become more diversified, there is a tendency to define managerial performance in terms of the results of the operating unit rather than of the corporation. Manager's rewards tend to be based solely on these results. Third, the key factor that appears to underlie these variations is the degree of autonomy between corporate and division managers. As diversification increases, the level of corporate-division and interdivision interdependence decreases. This variation requires corresponding variation in the design of reward systems.

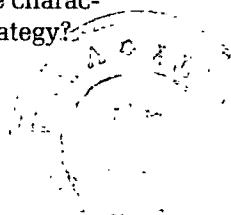
RESEARCH ISSUES

The studies reviewed above represent a significant initial step in understanding the effects of diversification on the design of reward systems. They suggest four issues about the relationship between strategy and system design. First, existing research has compared at most two strategies within a given study (e.g., related vs. unrelated diversification, internally generated vs. acquisitive). The effects of a full range of diversification strategies on the design of reward systems have not yet been examined. Such an examination would entail consideration of the extent of diversification, as well as the process by which diversification was achieved.

Second, prior research has concentrated on a few essential aspects of the managerial reward system: performance criteria, incentive compensation, and promotion. The effects of strategy on a complete system of rewards has not been explored. A comprehensive conceptualization of the reward system would include a full complement of tangible managerial rewards (e.g., bonus, salary, stock awards, perquisites, promotion), measurement mechanisms, and administrative practices by which rewards are distributed.

A third question concerns the extent to which the various elements of a managerial reward system are differentially affected by diversification strategy. Earlier research has not explored the possibility that different aspects of the system may be more or less sensitive to the influences exerted by diversification. While evidence exists that the bonus determination process varies widely across strategic categories (Pitts, 1974), little is known about the extent to which other aspects of the reward system vary over a range of diversification strategies.

Finally, earlier research has suggested that diversification influences the design of reward systems by generating demands for particular structural relationships (i.e., corporate-division and interdivision relations). It would be useful to identify additional demands on reward-system design that are generated by differing diversification strategies. Stated differently, an important question that has not been adequately addressed is: What are the characteristics of a reward system that support a given diversification strategy?



METHODS

Sample

Participating firms, located in the midwest and northeast sections of the United States, were chosen on the basis of size and diversification strategy. Eighteen of 20 firms fell within the *Fortune* 250 group in total sales (*Fortune*, 1981). For these firms, sales ranged from approximately \$1.3 billion to \$8 billion, with assets ranging from approximately \$0.9 billion to \$5.4 billion. Of the remaining two companies, one was ranked in the top 350 with sales of about \$0.9 billion on assets of \$0.7 billion. The other was not ranked; its sales were approximately \$0.3 billion on assets of \$0.2 billion. (Table 1 gives the sales volume category for each firm in the sample.)

Each firm was classified first according to Rumelt's (1974, 1977) typology of diversification, and second, according to the process by which diversification was achieved (Pitts, 1974; Leontiades, 1980). In the Rumelt framework, classification of a firm's diversification strategy rests on two criteria: type of diversification and pattern of linkage between units. The first criterion is numerically defined: if a firm obtains 95 percent or more of its revenue in a single domain, it is considered a single-product firm; 70-94 percent in a single domain indicates a dominant-product firm; less than 70 percent of revenues in a single domain, with the remainder related to a primary activity, indicates a related-product firm; less than 70 percent with the remainder not related indicates an unrelated-product firm.

Rumelt's second criterion, the pattern of linkage between units, identifies five such patterns: vertical, constrained, linked, multibusiness, and portfolio (Rumelt, 1977). A vertical pattern refers to a vertically integrated chain of businesses. A constrained pattern is one in which all businesses relate to a single core strength or characteristic. A linked pattern is one in which each business relates to one other business but not necessarily to more than one. A multibusiness pattern refers to a relatively small number (two to four) of unrelated businesses. A portfolio pattern refers to a conglomerate approach in which many different businesses are owned, but little attempt is made to link them together. The pattern of linkage criterion was not used as a classifying variable; its effect on reward system design is considered in the analysis and results section.

Although the pattern of linkage criterion attempts to incorporate a process component in the diversification concept, the Rumelt framework results in a more or less static typing of each firm. In order to more accurately capture the process of diversification, Leontiades (1980) distinguished between steady-state and evolutionary strategies, a distinction that rests on differences in the process of diversification. For evolutionary firms, growth occurs primarily through acquisitive diversification. These firms are externally oriented, actively prospecting in new markets and industries, and receptive to acquisitions, mergers, and joint ventures. In steady-state firms, growth occurs through internally generated diversification or through increasing penetration of existing markets (nondiversified growth). These firms are

internally oriented. They are concerned with the internal development of new products and technologies and with coordination across business units. The idea of steady-state and evolutionary strategies takes into account the possibility that firms may alter their diversification strategies over time.

While some firms are continually evolutionary and others continually steady state, many go through cycles of evolution and subsequent introspection in which changes are absorbed and rationalized. Perceived lack of growth opportunities, overabundance of cash, or the aggressiveness of top managers may trigger the cycle. Companies may be evolutionary in one period, steady state in another. Pitts (1980) has suggested that these growth modes are mutually exclusive at any point in time. Financial and managerial resources dedicated to one mode may preclude pursuit of the other.

The combination of diversification types and processes results in a 4×2 matrix of possible strategies. Table 1 shows the sample classified according to this two-dimensional scheme. In choosing sample firms, an attempt was made to represent each strategy with at least two firms.

Classification of sample firms was accomplished using two types of data: public materials and company materials. Annual reports and 10-K reports provided the financial data needed to classify each company in terms

TABLE 1
Sample Firms Classified by Diversification Strategy^a

Diversification Type	Process of Diversification			
	Steady-state Firms	Sales ^b	Evolutionary Firms	Sales ^b
Single-product (95% +) ^c	Allied Corporation International Corporation	B B		
Dominant-product (70-95%) ^c	Kelly Company Most Corporation	F C	Home Products A. B. Smith Alaska Industries	E D A
Related-product (70% or less) ^c	Best Products World Corporation Jones Manufacturing National Chemical	D E E C	Comtech Ellis Corporation	D C
Unrelated-product (70% or less) ^c	Kasper PMI Products Telecomp	D C B	Consolidated Leisure Time Alpha Corporation General Industries	C D D B

^aDue to the need to maintain confidentiality, all firm names are fictitious.

^bKey to sales volume categories (in billions):

A = 7.5 to 8.5	(1) ^c	D = 1.5 to 2.5	(6)
B = 5.0 to 6.0	(4)	E = 0.5 to 1.5	(3)
C = 2.5 to 3.5	(5)	F = Less than 0.5	(1)

^cPercent or number of firms with that sales volume.

of diversification type (single, dominant, related, etc.). This was done by calculating the proportion of revenues derived from various categories of activities. Judgments were then made as to the degree of relatedness between categories. Public sources such as *Moody's 1980 Industrial Manual* and *The Journal of Acquisitions and Mergers* were the primary sources of data in classifying firms as steady state or evolutionary. Each firm was examined through a 15-to-20 year history to ascertain the extent of its external activity (i.e., acquisitions, mergers, joint ventures, divestitures). Three years was used as a cut off criterion. If the firm had made no move within the previous three years to enter a previously unoccupied industry (by acquisition), the firm was classified as steady state. In addition, each firm was examined through a 15-to-20 year history in order to ascertain the consistency of its steady state, evolutionary, or cyclical pattern.

Each company's classification was further verified during the data collection interviews. The steady state and evolutionary categories were described to respondents, who were then asked to classify their companies. In each firm, a clear majority of respondents confirmed the classification.

No companies were found in the single-product evolutionary cell in Figure 1. Because the definition of the single-product firm is so restrictive (95% or more of total revenues from a single industry), any movement of significance by a firm in this category immediately moves it into the dominant-product class. Single-product firms, therefore, appear unlikely to follow the evolutionary pattern and remain single-product.

Respondents

The objective was to interview three types of managers in each firm. At least one individual was interviewed who was directly involved in the design or administration of the management compensation system. The intent was to obtain a description of the formal reward system from someone who was intimately acquainted with its structure and operation and who could explain the system, especially the extent to which its particular design had some conscious, underlying rationale.

The second type of respondent was a planning or strategic staff specialist. These respondents provided factual information about the company's current competitive position within its industry and its strategic history. They also helped describe the extent to which the firm integrated strategic planning with reward-system design. It was found that staff planners frequently were able to provide a broad picture of the company's strategy, distinctive strengths and weaknesses, and general culture.

Finally, a number of line or operating managers were interviewed. In divisionalized firms, the management level of particular interest was the divisional level. Division managers were responsible for a distinct strategic business unit. An effort was also made to interview group-level operating managers in order to understand how performance was judged and rewarded.

Interviews

Eighty-nine interviews were conducted in these 20 firms. The modal number of interviews per firm was 5, the average 4.5, with a range of 1 to 10 interviews. Most interviews lasted approximately 90 minutes, but ranged from 45 minutes to 2½ hours. The first interview in each company was a structured interview with a reward-system specialist. Comparable data on characteristics of reward systems were obtained from each firm. Interviews focused on reward systems operating at the level of division general management, though system design was generally found to be consistent for all but the top managerial levels. In nondivisionalized firms, focus was on high-ranking functional managers. The reward system was viewed as consisting of two major components: performance issues and formal rewards. Variables for these components are listed in Table 2.

Performance issues were comprised of performance definition, performance evaluation, and performance feedback. Performance definition is the process by which an organization identifies critical performance criteria. Criteria may be expressed in quantitative or qualitative terms (e.g., return on investment vs. new product development), may be connected to strategic objectives (e.g., cash generation for a "cash cow"), or may be linked to specific rewards (as when bonus is dependent on particular dimensions of performance). Variables measuring performance definition are shown in Table 2 (variables 1-6). Performance evaluation is the process by which an organization develops specific indicators for levels of performance. Evaluation may depend on objective or subjective indicators, may be carried out by one or several superiors, and may emphasize current, past, or future performance. Three variables measured performance evaluation (Table 2, variables 7-9). Performance feedback refers to the processes by which perceptions of performance are communicated to managers. Feedback may vary in terms of frequency, objectivity, source, and other factors (Table 2, variables 10-13).

Formal rewards consisted of bonus, salary increases, promotion, stock awards, and perquisites (Table 2, variables 14-35). Included were the administrative mechanisms and practices by which each reward was determined for specific individuals. Most firms had formal procedures by which individuals' performance evaluations were translated into particular types and amounts of rewards. These and other issues were examined, including the basis of inclusion in reward programs, determinants of reward amounts, and the connections to performance and strategy.

In all, 35 variables were examined in the structured interviews — 13 for performance issues, 22 for formal rewards. Eight questions were used to generate discussion in the open-ended interviews. In addition to evaluation and rewards, open-ended questions explored the firm's history, strategy, and the derivation of its management systems.¹

¹See Kerr, 1983, for a complete description of the interviews.

TABLE 2
Variables Examined in Structured Interviews

1. Quantitative vs. qualitative performance criteria	20. Determination of salary increase amount (objectivity)
2. Subjective vs. objective weighting of performance criteria	21. Potential range of salary increase as a % of salary
3. Linkage between specific criteria and specific rewards	22. Actual range of increases in use as % of salary
4. Current vs. future-oriented performance criteria	23. Basis for inclusion in stock plan(s)
5. Operating vs. financial performance criteria	24. Major determinants of potential stock award amounts
6. Performance defined by strategic mission	25. Major determinants of actual stock award amounts (in order of importance)
7. Subjective vs. objective performance evaluation	26. Determination of stock award amounts (objectivity)
8. Who carries out evaluation process?	27. Potential range of stock award as a % of salary
9. Time frame of the evaluation process	28. Time frame for payout of stock awards
10. Frequency of formal feedback sessions	29. Degree of enforcement of perquisite system
11. Dependency on superior-subordinate interaction	30. Emphasis on status differences as expressed in the perquisite system
13. Evaluative vs. developmental emphasis in feedback process	31. Primary motive for promotion or transfer
14. Basis for inclusion in bonus plan	32. Primary determinants of promotion or transfer
15. Major determinants of bonus amount (in order of importance)	33. General frequency of promotion or transfer
16. Bonus determination process (objectivity)	34. Promotional norm 1: promotion from within
17. Potential range of bonus as % of salary	35. Promotional norm 2: cross-divisional or cross-functional movement
18. Basis of bonus pool (corporate vs. division performance)	
19. Major determinants of salary increase amount (in order of importance)	

ANALYSIS AND RESULTS

Based on the structured interview data, a profile of performance issues and formal rewards was developed for each company. This was done by combining the descriptions of several respondents into a single composite for their firm. In cases of discrepancy, clarification was sought from the same or other respondents within the firm until a consensus was achieved.

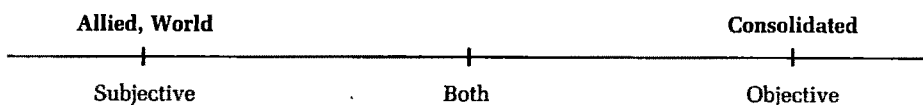
The composite description was recorded by the researcher on a form containing the 35 system variables listed in Table 2. Exhibit 1 shows the positions of three firms listed on three performance measurement variables. In terms of measuring managerial performance, Allied, for example, relied primarily on subjective evaluation by two or three superiors and considered mostly current performance indicators (with some consideration of the future consequences of decisions). World was similar on two variables, but evaluation was carried out by a single superior. Once a firm was positioned on all 35 variables, the completed profile was presented to respondents as a check on accuracy and validity.

After data on the reward system for each company had been organized, profiles were compared in order to identify firms exhibiting similar reward systems. This was done by arbitrarily assigning a simple numerical index of similarity. Two firms occupying the same category on a variable were rated a "4" (highly similar) for that variable. Two firms occupying contiguous categories were rated a "2" (moderately similar) for that variable. Two firms occupying opposite categories were rated "0" (dissimilar). By adding the 0's, 2's, and 4's for any pair of firms it was possible to calculate the degree of similarity of the reward systems in those two companies. Two firms dissimilar on every variable would receive a total of 0 (0×35); two firms highly similar on every variable would receive a total of 140 (4×35). Thus, Exhibit 1 indicates that Allied and World received a 4 for the first variable, a 2 for the second, and a 4 for the third, resulting in a similarity index of 10 out of a possible 12 (or .83). Allied and Consolidated received a 0, 0, 2 (or .17) as did the comparison between World and Consolidated.

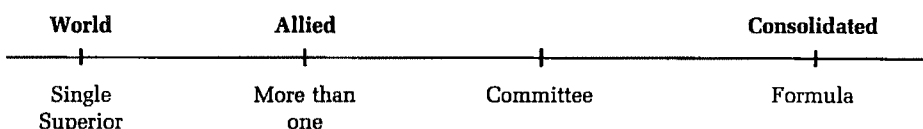
After all interfirm comparisons were completed, clusters of firms with similar reward systems were identified. The clustering procedure began with the identification of a single pair of firms exhibiting a high index of similarity. Another firm was then identified that demonstrated high or moderate similarity with both firms in the first pair. Subsequent firms were then examined to see the degree of similarity with these three, and so on. Firms that showed consistent, mutual high similarity were considered core members of the emerging cluster; those that showed inconsistent high similarity, or a combination of high and moderate similarity, were classified as fringe members of the emerging cluster. A firm was considered unaligned if it did not show moderate similarity to at least two members of a cluster, or if it showed high or moderate similarity to members of more than one cluster.

EXHIBIT 1
Examples of the Data Recording and Profile Comparison
Technique for Three of the 35 Reward-System Variables

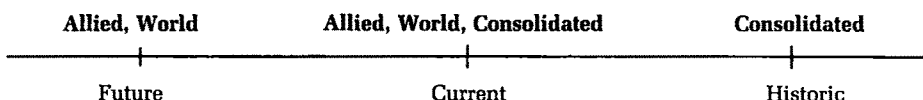
Subjective vs. objective measurement of performance:



Measurement function carried out by:



Time frame of measurement process:



Company Clusters

The comparisons and grouping procedure resulted in the emergence of three distinct clusters consisting of companies using similar reward systems. Three firms failed to align with any cluster or with each other.

Table 3 lists the firms in each cluster, each beginning with a focal company (identified by bolder type). A focal company is the firm that demonstrated the highest similarity indices with all other firms in its cluster. The number following each company name indicates the similarity index (expressed as a percentage of the potential maximum) of that firm with the focal company in its cluster. This shows the position of the firm relative to the center of its cluster. The number following each unaligned firm indicates the highest level of similarity demonstrated by that firm.

Table 3 also shows the mean similarity index and standard deviation for each cluster. Cluster B companies clearly demonstrated the greatest similarity in performance issues and formal rewards combined (Table 3a). Each firm fell within the highly similar range, which required an index of at least .70 relative to the focal company. Clusters A and C each contained two companies that fell within the moderately similar range relative to their focal firms, but remaining cluster members were highly similar. In sum, the three company clusters exhibited moderate to high similarity in the overall design of their respective reward systems.

TABLE 3
Results of the Comparison and Grouping Procedures

Cluster A	Cluster B	Cluster C	Cluster D	Unaligned
(a) Performance issues and formal rewards combined				
Allied	Consolidated	Kasper		Comtech
World .84 ^a	Leisure .87	Alaska .77		(.67—Home)
Intern .73	Jones .80	Smith .70		Ellis
NaChem .71	Alpha .76	Most .68		(.57—Consol)
Kelly .64	General .76	PMI .66		Telecomp
Best .64	Home .70			(.57—Kasper)
mean = .71	mean = .78	mean = .70		
s.d. = .07	s.d. = .06	s.d. = .04		
(b) Company clusters based on performance issues only				
Allied	Consolidated	Kasper	Comtech	
Intern .89	Leisure .88	Alaska .85	Home .85	Ellis
NaChem .88	Jones .85	Most .85	PMI .73	Telecomp
World .85	General .81	Smith .73		
Kelly .81	Alpha .74			
Best .74				
mean = .84	mean = .82	mean = .81	mean = .79	
s.d. = .04	s.d. = .05	s.d. = .06	s.d. = .06	
(c) Company clusters based on formal rewards only				
Allied	Consolidated	Kasper		
World .78	Leisure .83	Alaska .70		
Intern .65	Home .76	PMI .65		
NaChem .59	Jones .72	Smith .65		
Comtech .54	General .70	Most .57		
Best .52	Alpha .59			
mean = .62	mean = .72	mean = .64		
s.d. = .09	s.d. = .08	s.d. = .05		

^aSimilarity index expressed as % of potential maximum. Firms scoring $\geq .70$ were considered core firms; those scoring $< .70$ were considered fringe firms.

System Components Analyzed Separately

In order to identify specific points of similarity and dissimilarity, the same analysis was done separately on performance issues and formal rewards. Clusters were formed first by comparing firms on the 13 performance issue variables, then on the 22 formal reward variables.

Table 3b shows the results of the analysis of performance issues. Two features are immediately apparent. First, a fourth cluster emerged consisting of Comtech, Home, and PMI. In the combined analysis, Comtech was unaligned and Home and PMI grouped with Clusters B and C, respectively. Table 3b indicates that Home and PMI were closer to Comtech on the performance issue variables. The focus on performance issues appears to provide considerably greater discrimination between clusters than does the combined analysis.

The second difference between this and the combined analysis is the degree of similarity and cohesion within clusters. With one exception, the similarity index of every clustered firm increased, in most cases substantially. These results indicate increased similarity and cohesion when clusters are based on performance issues only. The emergence of the fourth cluster suggests that distinctions between reward system types are most clearly evident in performance issues.

Table 3c shows the results of the analysis of formal rewards. The fourth cluster evident in the analysis of performance issues did not emerge here. The striking feature in this analysis is the sharp decrease in similarity and cohesion within each cluster. With the exceptions of Home, PMI, and Comtech, the similarity index of every clustered firm is substantially lower.

In general, these results show that grouping firms on the basis of formal rewards obscures differences between clusters. While performance issues are relatively homogeneous within each cluster, the analysis of formal rewards indicates there is substantial variation in the way cluster members administer formal rewards. To the extent that the design of reward systems is systematically related to strategy and structure, it seems these have their greatest effect on the performance-issues part of the reward system.

Only one variable in the performance-issues category failed to differentiate among the three systems. This was the time frame of the measurement process. The formal measurement process for all three sets of firms emphasized current performance with little acknowledgement of long-term factors. No difference was found across the three clusters on this variable.

Within the formal-rewards component, a number of variables failed to differentiate completely. These were primarily in the administration of salary increases, stock awards, and perquisites. Variables pertaining to the administration of bonuses and promotions, however, exhibited very clear differentiation. These were the only formal rewards that matched the performance definition, measurement, and feedback elements in differentiating across clusters. This finding suggests that the effects of strategy on the design of reward systems are most clearly evident in performance issues, bonuses,

and promotions. Apparently, the remaining formal rewards are less sensitive to variations in strategy, or are more strongly affected by other factors.

The following sections will briefly describe the reward systems operating in each cluster of firms, and the link between reward-system design and diversification strategy.

Three Designs for Reward Systems

The hierarchy-based system. A profile of the reward system used by Cluster A firms is summarized in Table 4. This system is termed hierarchy-based because evaluations were dependent on the perceptions and judgment of superiors, and the distribution of rewards was based on position in the hierarchy.

Performance tended to be defined qualitatively at least as much as quantitatively. Generally, firms did not connect performance criteria to strategic missions or to specific rewards. Evaluation was strongly subjective and emphasized current performance. There was frequent informal consideration of the future implications of current performance. Feedback consisted of one formal session per year, but interaction between superior and subordinate was frequent. Because of subjective definition and measurement of performance, subordinates were highly dependent on superiors for feedback.

Potential bonus awards in this system were determined primarily by corporate performance and position in the hierarchy. Actual bonus amounts were determined through a combination of objective and subjective decision mechanisms (e.g., a formula calculation adjusted by superiors). Of particular interest was the maximum potential bonus: 20 to 30 percent of salary.

Salary increases were based on performance and tenure. The Hay system or some variant was pervasive in these firms. These systems combine objective factors (e.g., tenure, grade) with subjective judgments (performance). Stock awards were handled even more subjectively. Participation in stock plans was clearly based on grade, but the determination of stock amounts was subjective and not closely linked to performance.

Elaborate perquisites simply did not exist in these firms. Those that did exist were granted to specific organizational groups, like salesman, and were monitored carefully. However, these companies did maintain policies governing status indicators, like office space, furniture, and travel arrangements. Cluster A firms consistently promoted from within and did so relatively frequently (every 2-4 years). Cross-fertilization (cross-divisional or cross-functional mobility) was the norm, and mobility was motivated by individual development needs more often than by the immediate need of the organization.

The performance-based system. The Cluster B reward system was in many ways the direct opposite of Cluster A's (see Table 4). It is termed performance-based because it stressed precise definition and measurement of performance, and a close tie between performance and rewards. Performance was defined quantitatively with specific aspects of performance

TABLE 4
Composite Profiles of Reward Systems

	Cluster A	Cluster B	Cluster C
Performance Issues:			
Definition	Qualitative, subjective weighting, rewards not linked to strategic mission or to specific performance criteria.	Quantitative, objective weighting, rewards linked to strategic mission and to specific performance criteria.	Both qualitative and quantitative, subjective and objective weighting, rewards generally linked to strategic mission and specific criteria.
Measurement	Subjective, by one or two superiors, time frame basically current with informal future orientation.	Objective, frequently formula-based (financial), often with historic component.	Both subjective and objective, by one or more superiors, current performance emphasized.
Feedback	One formal session, high dependency on superior for information, frequent superior-subordinate interaction, developmental emphasis.	No formal session or more than one, low dependency on superior, infrequent interaction between superior and subordinate, evaluative emphasis.	Zero, one, or two formal sessions, high dependency on superior, frequent interaction, developmental and evaluative emphasis.
Formal Rewards:			
Bonus	Based on corporate performance and grade, both objective and subjective determination of amount, 20-30% of salary maximum.	Based on division performance, amount objectively determined, maximum bonus: 40% of salary to no limit.	Both objectively and subjectively determined, based indirectly on performance, rank, and tenure, maximum: 20-75% of salary.
Salary increase	Based on performance and tenure, objectively determined (Hay system).	Based indirectly on performance, subjectively determined.	Objective and subjective determination.
Stock awards	Subjectively determined amounts.	Subjectively determined amounts.	Objective and subjective determination.
Perquisites	Perquisite system enforced, status differentials present.	Perquisite system almost nonexistent, status differentials deemphasized.	Perquisite system present and enforced, status differences not strongly emphasized.
Promotion	From within, developmentally motivated, relatively frequent, cross-fertilization common.	From within and without, motivated by organizational need, relatively infrequent, usually vertical (not diagonal).	From within, developmentally motivated, relatively frequent, cross-fertilization stressed.

numerically weighted and linked to specific rewards. Strategic missions (e.g., increase in market share, cash generation) were clearly reflected in performance criteria.

Evaluation was objective and stressed current performance. It frequently relied on a formula using financial results as input. Measurement was accomplished by the accounting system with relatively little input from superiors. Corporate influence was exerted by emphasizing given factors in the reward formula. Feedback was characterized by a strong evaluative emphasis and a low level of interaction between superior and subordinate. Some firms had no formal feedback sessions; others had two or more. This erratic pattern may be attributable to infrequent personal contact, and to subordinates having access to performance data independent of their superiors.

Bonuses were based almost entirely on the performance of managers' units with little consideration of other factors. Bonus amounts were determined through formulae and only rarely modified. They ranged from 40 percent of salary to "no limit." In contrast, salary increases were only indirectly related to performance. No numerical correlation was calculated. Raises were determined subjectively; factors such as the external labor market, cost of living, and general performance were considered.

Stock awards were also distributed subjectively, with only a rough link to performance, tenure, or other factors. Because these firms were active acquirers of other firms, inclusion in the stock plan was often part of negotiating the acquisition. Perquisites were even more austere in this cluster, with even the common badges of status minimal or nonexistent.

Cluster B firms did not follow a norm of promotion from within, nor was cross-fertilization an important objective. Promotions were generally infrequent and vertical (i.e., within the same unit or function). Promotions were usually motivated by a vacancy, not by the individual's need for experience and personal development.

The mixed system. Cluster C's reward system resembled Cluster A's on some variables and Cluster B's on others. The result was a compromise that fell between the two polar systems. The mixed system is also summarized in Table 4.

Two Cluster C firms, Kasper and Most, handled performance definition quantitatively, and three used a combination of quantitative and qualitative criteria. All but one of these firms, PMI, weighted specific criteria either subjectively or through a combination of subjectivity and objectivity. In three firms, performance was clearly linked to strategy, while in two, Most and Smith, it was partially so. The same was true regarding the performance-reward linkage; in three it was quite clear; in Alaska and Smith it was partially so.

All Cluster C firms used a combination of subjective and objective performance measurement mechanisms. In some firms, evaluation was done by a committee of superiors. Cluster C firms tended to rely on a current time frame in the measurement process. Cluster C firms also varied in the number of formal feedback sessions. Kasper held none; others held either one or two.

No pattern was discernible on this variable. Dependency on the superior for feedback, however, was either high or moderate in all five firms, and the frequency of superior-subordinate interaction was uniformly high. Cluster C firms generally reported a combination of developmental and evaluative emphasis in the feedback process.

As in Cluster B, these firms tended to base managers' bonuses on the results of their subunits. Again demonstrating a middle position, Cluster C firms used a combination of objective and subjective processes in determining bonus amounts. The range of the maximum bonus was wide—from 20 percent to 75 percent of salary across the five companies. Cluster C firms also showed an inconsistent pattern regarding salary increases with objective, subjective, and combination decision processes used. Raises were based primarily on performance, but rank and tenure were factored into salary adjustments. Two Cluster C firms, Kasper and PMI, determined stock award amounts objectively by means of a financial or numerical calculation tied directly to performance. The remaining three used subjective processes depending on managerial judgment.

Perquisite systems existed throughout the cluster. In Most and PMI the systems were carefully enforced. Policies regarding the distribution of perquisites and symbols of status were followed and policed. This was the strongest expression of the use of perquisites across the three clusters.

In terms of promotion and movement patterns, Cluster C firms were much like Cluster A. The companies tended to stress promotion for developmental purposes rather than for filling vacancies. Also, all five Cluster C firms reported moderately to highly frequent rates of promotion (i.e., a move roughly every two to four years). These companies uniformly reported strongly-held norms for promotion from within and for cross-fertilization of managers.

The discussion so far has provided an overall description of the reward systems found in the three clusters. Now the relationship between these system types and diversification strategy will be considered.

Diversification Strategy and Design of Reward Systems

To examine the relationship between the design of reward systems and diversification strategy, each firm was listed according to its reward-system cluster and its strategy classification. Results are presented in Table 5. The extent to which a firm derived revenue from a more or less narrow set of activities did not adequately explain the composition of the clusters (Rumelt, 1974). Firms using the hierarchy-based system (Cluster A) ranged from single to related-product. Those using the performance-based system (Cluster B) ranged from dominant to unrelated-product. Those using the mixed system (Cluster C) were dominant and unrelated-product firms. These results suggest that, in itself, a firm's level of diversification does not represent a primary influence on the design of its reward system.

The second designation in Table 5 shows the relationship between design of reward systems and Rumelt's pattern of linkage criterion. Pattern of linkage refers to the interrelatedness of the firm's strategic business units in terms of

TABLE 5
Companies by Cluster and Strategy Classifications

	Cluster A (Hierarchy-based)	Cluster B (Performance-based)	Cluster C (Mixed System)	Nonaligned
Allied	SGL/VER/SS ^a	Home	Alaska	REL/CON/EV
Intern.	SGL/VER/SS	Jones	Smith	REL/LNK/EV
Kelly	DON/CON/SS	Alpha	Most	UNR/MUL/SS
NaChem	REL/CON/SS	Consol	Kasper	DOM/CON/SS
World	REL/LNK/SS	General	PMI	UNR/MUL/SS
Best	REL/CON/SS	Leisur	UNR/MUL/SS	UNR/MUL/SS

^aFirst classification is by diversification type, with SGL = single, DOM = dominant, REL = related, UNR = unrelated; second classification is by patterns of linkage, with VER = vertically integrated, CON = constrained, LNK = linked, MUL = multibusiness, PFO = portfolio; third classification is by diversification process, with SS = steady state and EV = evolutionary.

products, markets, or technologies (Rumelt, 1977). While this variable also failed to explain cluster composition in this sample, it showed noticeably greater consistency than did degree of diversification. In Cluster A, five of six firms had either vertically integrated or constrained patterns of linkage. These represent the first and second strongest forms of interrelatedness between units. In Cluster B, five of six firms had either linked or multibusiness patterns of linkage. These are considerably weaker forms of interrelatedness. In Cluster C, three of five firms had either linked or multibusiness linkages, while a fourth showed a portfolio pattern — the weakest form of interrelatedness.

These results suggest that the degree of relatedness among a firm's constituent units is roughly associated with particular reward system designs. While the relationship is weak, it is intuitively sensible. Earlier research has argued that effective reward systems must respond to the imperatives posed by organization structure (Salter, 1973). Because degree of relatedness is likely to reflect organization structure more closely than level of diversification, it is reasonable that reward-system design is more strongly associated with this aspect of diversification.

The third designation in Table 5 shows the relationship between reward system design and steady state or revolutionary processes of diversification. In Cluster A, all six firms were steady state. In Cluster B, five of six firms were evolutionary. Cluster C showed neither a consistent steady state nor evolutionary pattern. These results suggest that the hierarchy-based reward system provides needed support for firms pursuing a steady state strategy, while for firms pursuing an evolutionary strategy, the performance-based system appears to be useful. This interpretation is explored in the following section, and a tentative explanation is given for the lack of clear relationships in Cluster C firms.

EXPLAINING THE RELATIONSHIP BETWEEN STRATEGY AND SYSTEM DESIGN

Cluster A

The overriding characteristic of the steady-state strategic posture is a high level of commitment to existing products and markets. Steady state firms are generally not receptive to acquisitions, mergers, joint ventures, or other activities that place them far from their existing businesses (Leontiades, 1980). Growth occurs primarily in areas in which the firm currently operates, either by penetration of existing markets or by diversification into closely related areas. Because these firms reject external activities as a means of quickly altering their domains, survival depends on the ability to compete successfully in a stable set of businesses. The necessary commitment of physical, financial, and managerial resources to these businesses precludes the option of steady state firms moving easily out of these areas and into others.

The commitment of steady state firms to their businesses requires the support of internal management systems that foster managerial stability and a long-term perspective. Reward and control systems must generate attitudes and behaviors that work to preserve the firm's strengths and distinctive competences. The consequences of decisions must be considered more carefully than in firms where divestiture is viewed as a viable alternative. The need to maintain physical and human resources may sometimes lead to the sacrifice of short-term profits for long-term viability. Stability and continuity are critical issues in these circumstances. The need for control and coordination is likely to be viewed as a higher priority than the need for entrepreneurial activity.

The usefulness of the hierarchy-based system for steady-state firms stems from its ability to provide a more intimate form of control than do performance-based or mixed systems. Control is based on monitoring behaviors rather than outcomes (Kerr & Slocum, 1981; Ouchi & Maguire, 1975). It is exercised through surveillance and frequent contact between superior and subordinate. Performance definition, measurement, and feedback are strongly subjective, leading to a high degree of dependency on superiors for feedback, rewards, and socialization.

This system of control supports a steady-state firm's need for stability and continuity in a number of ways. First, it is a primary instrument for transferring an organization's values and style of management to junior managers (Deal & Kennedy, 1982). There is frequent contact between superior and subordinate, a developmental emphasis in evaluation, and recognition of the importance of qualitative performance criteria. All of these promote consistency in the way the firm's environment is viewed by organization members, and in the pattern of decisions made by successive generations of managers.

Second, the steady-state posture requires a long-term perspective and concern for the interdependencies between organizational units. Yet these issues are among the most difficult factors to quantify and evaluate. The inclusion of a significant subjective and qualitative component in performance definition and measurement allows a hierarchy-based system to account for these factors. The norm of promotion from within means that subjective judgment is grounded in experience and intimate knowledge of a subordinate's role. There is a good chance that a superior may have at one time held the position of the subordinate. Subordinates are further encouraged to take a long-term, corporate perspective because a norm of promotion from within means they are more likely to remain with the organization as their careers progress.

Third, the practice of cross-fertilization and the emphasis on corporate rather than individual performance works to promote a systemic perspective in managers. This is important because the steady-state strategy requires careful consideration of interdependencies and system-wide consequences of decisions.

In short, the hierarchy-based system promotes a long-term perspective in managers, encourages a system-wide view and a sensitivity to interdependencies, and imparts consistency in the way managers perceive and respond to the firm's environment. There are critical issues for steady state-firms because successful pursuit of their strategy requires stability, continuity, and a high level of commitment to existing markets and resources.

It is important to recognize that it is the stability implicit within the steady-state strategy that seems to exert the clearest influence on reward system design. This influence is strongest at levels of diversification ranging from single-product to related-product. The fact that two unrelated-product, steady-state firms used the mixed reward system suggests that the hierarchy-based system may be less advantageous at very high levels of diversification. This point will be discussed in a later section.

Cluster B

In Cluster B, five of six firms using a performance-based system were evolutionary. Evolutionary firms are receptive to acquisitions, mergers, joint ventures, and other forms of external activity. Growth frequently takes place through movement into areas unfamiliar to the organization or only somewhat related to existing businesses. Because acquisition and divestiture are common occurrences, commitment to existing businesses can be lower than in steady-state firms. Survival, at least to some extent, depends on pursuing change successfully. This entails choosing acquisitions carefully and divesting in a timely manner.

An evolutionary strategy creates different demands on the reward system than does a steady-state strategy. First, corporate-level managers are unlikely to have significant experience in more than a few of the firm's businesses. This means performance evaluation must be carried out at arm's length. Financial indicators, rather than intimate knowledge of subordinates' jobs, become the basis for evaluation. The distribution of rewards must be made in a way that is defensible to subordinates because superiors cannot claim their own experience as justification for reward decisions.

Second, frequent evolution of the firm's portfolio of businesses means much of top management's time will be spent deciding how to allocate resources among diverse businesses. This requires a form of performance measurement that reduces all results to a few common denominators that are comparable across divisions. Frequent evolution also decreases the level of interdependence between divisions. There is less time and motivation among managers to develop synergistic relationships.

Third, a low level of interdependence between divisions lessens the need to control and reward subtle issues of cooperation between division managers. At the same time, it fosters demands on management systems to generate a greater sense of autonomy and entrepreneurial freedom. Because corporate management is not familiar with the business and interdepend-

ence is low, the source of entrepreneurial activity and innovation must be at the divisional, rather than corporate, level of general management.

The performance-based reward system meets the needs of the evolutionary firm primarily because it provides control by monitoring outcomes rather than behaviors. By concentrating on financial indicators as measures of performance, the system allows direct comparison across diverse businesses. Controlling on the basis of financial outcomes also provides an objective means for evaluating potential acquisition or merger targets relative to existing businesses. The performance-based system does not require the intimate knowledge and frequent surveillance needed by the hierarchy-based system. Because control is based on outcomes, corporate-level managers can monitor more numerous and diverse businesses with less time and effort devoted to each. This eases an important constraint on firms that change their mix of businesses frequently.

In addition, the performance-based system emphasizes variable compensation in the form of a bonus tied directly to performance. This addresses two important concerns for evolutionary firms. First, it removes the need to justify reward decisions made by corporate-level managers who are not experienced in each business. Once both superior and subordinate agree to the compensation formula or arrangement, the outcome is essentially out of the superior's hands. Second, this arrangement works to promote a feeling of ownership among divisional managers. A direct relationship between performance and reward ties each individual's outcomes to those of the business unit. The arm's length relationship between corporate and division managers means the entrepreneurial burden resides at the divisional level, and division managers realize the benefits of their efforts.

In short, an evolutionary strategy requires management systems that provide comparability across diverse businesses, or across old and new businesses. It also requires that performance evaluation and reward decisions be made equitably and consistently by managers who may have little experience in the activities they judge. Administrative policies must also promote a strong sense of autonomy and the willingness to engage in entrepreneurial activity. The performance-based reward system is used by evolutionary firms because it emphasizes financial indicators as performance criteria, and because it encourages and responds to an entrepreneurial orientation in managers. Perhaps most important, the performance-based system does not require extensive involvement and experience from corporate-level managers in allocating rewards.

A comment is merited on Jones—the one firm in Cluster B that was not evolutionary. In this case, the firm's circumstances were conducive to initiating a strategy of acquisitive diversification. Most of the top management group, including the architects of the management reward system, were strongly in favor of such a strategy. However, the CEO — due to retire shortly — was adamantly opposed. One result of this conflict was a firm poised for change. Reward and control mechanisms were designed for a strategy that had not yet been implemented but very likely would be in the near future.

Cluster C

The lack of a clear pattern in Cluster C raises some especially interesting questions. Neither type nor process of diversification seems to explain the cluster, yet the analysis showed reasonable consistency in reward systems across firms.

A possible explanation for the grouping of the three dominant-product firms is the transitory nature of their current strategies. Alaska, until very recently, has been actively diversifying into new, unrelated areas of activity. Smith has also been acquiring businesses in related but new areas of activity. The strategies of these two firms are characterized by a shift from a limited to a more diversified posture through an acquisitive process. Most, on the other hand, after pursuing diversification in the late '60's and early '70's, is retreating to a less diversified position. All three firms are in transition, two pursuing greater, and one pursuing less diversification.

The two remaining firms in cluster C both have an unrelated-product, steady-state strategies. They are also quite similar in their approach to managing highly diversified businesses. Each is organized into very distinct, very autonomous groups of divisions. The presidents of these groups are powerful and have authority to make virtually all decisions. Internally, these groups may be thought of as related-product firms in their own right. Each is comprised of several divisions related by technology or markets. Both firms are characterized by a high regard for independence and autonomy in their managers, but within well-understood cultural and normative constraints. Each is also characterized by low management turnover, cross-fertilization, promotion from within, and long socialization. The autonomy and independence characteristic of the structure is balanced by an overarching culture of shared values and expectations.

We thus have two subgroups within Cluster C, each having a particular approach to diversification and decentralization. The first subgroup consists of three firms currently changing the extent of their diversification; two of these are relative newcomers to the acquisitive process. The mixed system's blend of qualitative and quantitative performance issues, of objective and subjective determination of rewards, allows these firms to continue managing their primary businesses in familiar ways, and allows them to control through financial indicators those new businesses that are not yet fully understood. It also permits expression of the parent company's culture, expectations, and values, without unduly constraining the autonomy of the new divisions to operate as necessary.

The second subgroup consists of two firms long used to the problems of diversification but with a strong tradition of managing — not simply owning — the highly diverse businesses that comprise them. For these firms, the mixed system not only provides objectivity and comparability across widely divergent activities, but also allows for the expression of a culture that ties these activities together. The blend of subjectivity and objectivity is appropriate for the level of diversification in these firms and for a philosophy of management that requires a balance of control and autonomy.

The fact that two unrelated-product, steady-state firms used the mixed reward system, but none used the hierarchy-based system, suggests that the latter system does not provide the support needed for high levels of diversification. This implies an interaction between degree and pattern of diversification; at high levels of diversification, steady-state firms do not find the hierarchy-based system adequate. Instead, they use a system that provides some of the benefits of both system types.

The mixed system, then, seems to be used by firms pursuing diversification and organizational strategies that require a combination of reward and control mechanisms. In the first subgroup, this requirement derives from the changing posture of these organizations — that is, from their transitional status in terms of diversification and decentralization at this point in time. In the second subgroup, the requirement arises from the stable but complex management system that follows from a philosophy of managed relationships, with corporate-level involvement, in a context of high diversification.

Two related arguments follow from this reasoning. First, mixed systems emerge as the firm moves from low levels of diversification to some higher level. Prior to acquisitive diversification, firms use a hierarchy-based system. After acquisition, managers move to a mixed system because of their lack of knowledge about the new business, and because of the greater accountability for results that comes from low interdependence. If the firm continues to acquire new and unrelated businesses, it may pass through the mixed system into a performance-based system — appropriate for high levels of diversification, unfamiliar products and markets, and clear identifiability of results. This line of reasoning was suggested by Ouchi, who found that knowledge of transformation processes and availability of output measures influences the type of control system used (Ouchi, 1977; Ouchi & Maguire, 1975).

The second argument concerns the idea of the control system as a constraint on the level of diversification pursued by a firm. If the management philosophy of the company is one that entails direct behavioral control in the form of a hierarchy-based system, it is possible that the system itself becomes a major strategic constraint. Once accustomed to the hierarchy-based system, corporate managers may be unwilling to shift to a system that permits decentralization (a prerequisite for diversification), or may be willing to do so only until hierarchy-based control can be reestablished. Perceived need for control and the resulting reward system can thus operate as a lead variable in the development of corporate strategy.

CONCLUSIONS

This study has examined the relationship between diversification strategy and the design of managerial reward systems in 20 large industrial firms. Three system designs were identified. The first was used primarily in firms that maintained a steady-state strategic posture. This strategy emphasizes growth in current areas of activity or through internally generated diversification. The second system was used by firms pursuing evolutionary growth

through acquisitions and mergers. The third reward system was used by two subgroups of firms. The first subgroup was in transition regarding levels of diversification, which were either increasing or decreasing. The second subgroup was attempting to manage actively a highly diverse set of activities. Reward system design was thus interpreted to be a function of requirements for structural support generated by varying diversification strategies.

Of particular interest was the finding that overall levels of diversification were not associated as strongly with the design of reward systems as was the distinction between steady state and evolutionary strategies. This distinction rests on the issue of growth through acquisitive diversification versus growth through internally-generated diversification (or nondiversified growth) over time. It seems reasonable, therefore, to interpret the data as indicating that it was the long-term processes by which diversification was achieved, rather than the cumulative extent of diversification at a given point in time, that was most closely related to the design of reward systems.

This finding may help to explain the weak but suggestive relationship found between reward-system design and the variable concerning pattern of linkage. This variable, which represents the degree of relatedness between business units, is likely to reflect the historical process by which diversification was achieved. To the extent that the design of reward systems is responsive to the process of diversification, it is also likely to correspond to patterns of linkage.

In general, the reward systems identified here clearly showed stronger similarity and cohesion in the performance issues of definition, evaluation, and feedback, and on bonuses and promotions. The implication is that, to the extent the design of reward systems can be attributed to strategy, it is these system elements that are most affected by strategy. Certainly, regarding performance issues this is not surprising. It is in the definition and evaluation of performance that top management has the best opportunity to articulate its strategic vision. Bonuses are the formal rewards least constrained by staff policies and subordinate expectations. They are therefore the most flexible and responsive elements, and the most useful as feedback and strategic control mechanisms. Promotion is perhaps the most interesting of the formal rewards because of its complex and intimate connection to strategy. As Pitts (1976) reported, promotion and mobility vary markedly with processes of diversification. This is undoubtedly due to the fundamental requirement that firms support any strategic decision — short term or long range — with management talent and human resources, in general. The lack of such resources may, in fact, eliminate an otherwise attractive strategic option.

Results clearly indicated that at least two reward systems designs are associated with aspects of diversification strategies. It would be useful if future research would focus on more rigorous tests of hypotheses generated, and on more subtle aspects of the relationships involved than were possible in this research. Of particular interest is the question of lead versus lag in the interplay of strategy and design of reward systems.

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AN EMPIRICAL EVALUATION OF THE POTENTIAL FOR INCLUDING SHAREHOLDERS IN CORPORATE CONSTITUENCY PROGRAMS

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The purpose of this research was to extend the literature related to the effectiveness of corporate political strategies. The research examined the attitudes of 2,151 shareholders from six major corporations to investigate the feasibility and effects of including shareholders in corporate constituency programs. The results suggest that shareholders, most of whom generally support corporate political activity and desire involvement in these efforts, are a resource that firms can employ to influence their external political environments. The results also suggest that constituency building activities have a positive effect on shareholder attitudes.

The external political and regulatory environment has been recognized as a significant source of turbulence and uncertainty for many organizations (Aplin & Hegarty, 1980; Charan & Freeman, 1980; Miles, 1980; Pfeffer & Salancik, 1978; Weidenbaum, 1980). In response to these pressures, corporations have developed specialized units and have implemented a variety of strategies intended to influence public policy toward the private sector (Baysinger & Woodman, 1982; McGrath, 1977; Post, Murray, Dickie, & Mahon, 1982; Zeithaml, Keim, & Baysinger, 1985). The political strategies that have evolved rely extensively on the establishment of relatively new and complex relationships between the firm and its task environment.

These strategies, which include campaign contributions through political action committees (PAC), issue and advocacy advertising, and development of corporate constituency programs, differ from traditional approaches such as direct lobbying and corporate campaign contributions in that the success of the new strategies usually depends on the political activities of individuals and groups who are not directly controlled by or accountable to the corporation, at least with respect to this role. These strategies call upon shareholders, employees, suppliers, industry associations, and the general public to act as intermediaries between the firm and public policy decision makers. Corporations attempt to manage relations between these groups and themselves so as to reduce organizational uncertainty and dependence on the political environment. Therefore, the attitudes and political activities of these groups represent potential political resources for the corporation,

resources that may be developed and mobilized in the pursuit of corporate objectives.

Recently, management scholars have demonstrated much theoretical and empirical interest in the strategies and structures used to manage organization-environment relationships. Organization theorists have acknowledged the use of these political strategies, have furnished concrete examples, and have discussed their theoretical implications (Baysinger, 1984; Miles, 1982; Pfeffer & Salancik, 1978). However, the literature has provided only limited empirical support for the general feasibility and effectiveness of such strategies. Previous empirical research has been primarily descriptive, and evaluation efforts have addressed only conceptual issues. The descriptive evidence suggests that corporations have increased their use of the three strategies mentioned above (Federal Election Commission, 1983; Sethi, 1979; Zeithaml et al., 1985). Corporate constituency programs have drawn conceptual support (Keim, 1981; Keim & Baysinger, 1982), as well as indirect empirical support (Aplin & Hegarty, 1980), whereas PACs and issue advertising have received adverse criticism (Keim, 1981; Keim & Baysinger, 1982; Malbin, 1979), concerning both their relative ability to influence public policy and their propensity to stir up controversy.

The purpose of this study was to extend the literature on corporate political strategies by focusing on two specific issues regarding corporate constituency programs. First, we attempted to evaluate the feasibility of establishing constituency programs for individual shareholders by examining shareholders' attitudes toward corporate political activity and their potential personal involvement as third-party corporate advocates. Our research agenda included the feasibility evaluation because, despite their economic relationship to the firm, individual shareholders tend generally to be apathetic concerning strategy formulation and implementation (Alchian & Demsetz, 1972; Manne, 1964; Manning, 1958). In addition, previous research (Zeithaml et al., 1985) had demonstrated that many corporate executives believe that individual shareholders are, as a group, too diverse to represent a viable political resource for the corporate sector. Previous research had also suggested that some executives fear that corporate political programs aimed at shareholders may evoke a hostile response from many shareholders who disagree with the basic notion of corporate political activity.

The second part of this study evaluated the impact of corporate constituency programs on attitudes of shareholders. A number of corporations have engaged in new programs to develop their shareholders as a political resource. Several firms have invested considerable time and money in efforts to augment their political resources with politically active shareholders. However, systematic evaluation of the outcomes of these attempts to strengthen the link between the corporation and individual shareholders has been quite limited. Consequently, our research examined attitudinal differences among individual shareholders exposed to various degrees of corporate constituency program activity.

BACKGROUND

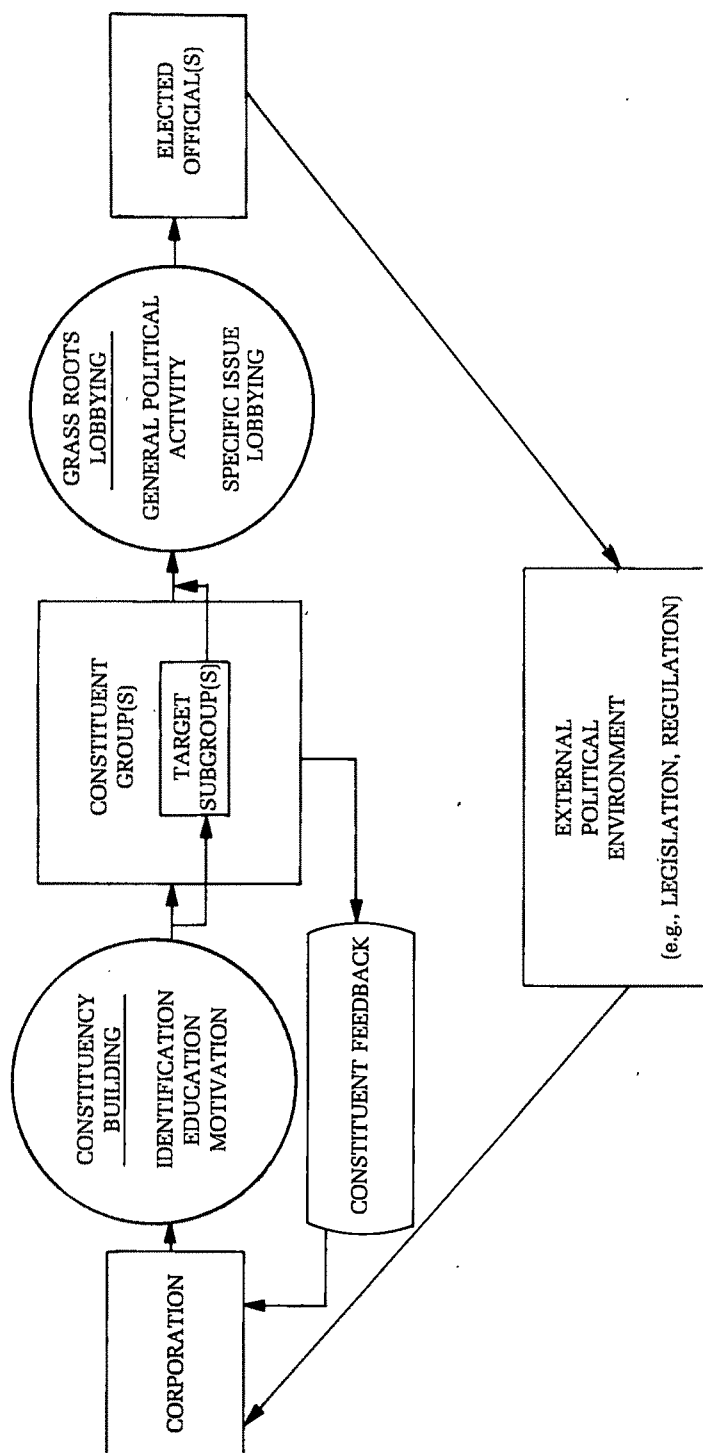
The past 25 years have been marked by a dramatic escalation in the social and regulatory scrutiny focused on U.S. businesses (Weidenbaum, 1981). This period saw a transition from an essentially laissez-faire philosophy on the part of government to extensive government involvement in regulating business (Aplin & Hegarty, 1980). In addition, many private sector organizations have attempted to exploit public institutions in pursuit of their parochial interests (Pfeffer & Salancik, 1978). In response to this change in business-government relations, corporations have adopted alternative political strategies intended to reassert managerial autonomy, lower costs imposed by regulation, obtain subsidies, limit taxes, and control competitive entry into markets. Constituency program activity has been suggested as an important addition to the strategic behavior of corporations (Baysinger, 1984).

Corporate Constituency Programs

The success of a corporate constituency program depends on the effectiveness of the two processes depicted in Figure 1. The first process is constituency building—corporate efforts to identify, educate, and motivate to political action individuals who may be affected by public policies that also have an impact on the corporation. Relevant constituent groups include shareholders, employees, suppliers, dealers, and residents of communities in which the corporation has a significant presence. In some cases, the corporation may identify a target subgroup of constituents who share certain interests or relationships to specific elected officials. Although it may direct educational efforts at the general population of constituents, the corporation may attempt to motivate only this select subgroup for action on a particular issue. Effective constituency building is fundamental to the overall success of a corporate constituency program, since the process develops the critical link between the corporation and the constituent.

The second process is grass-roots lobbying. Corporations typically design the educational component of the constituency-building process to increase the general political awareness and activity of constituents. Constituents' involvement in political parties, voting behaviors, or grass-roots lobbying may all reflect such increased awareness and activity. The long-term benefits of these activities are difficult to identify. Identification and motivation activities aimed at specific subgroups are usually undertaken to stimulate grass-roots lobbying by constituents on specific issues. These grass roots efforts are often directed at a particular group of elected officials (for instance, a key congressional committee or subcommittee) and usually emphasize direct constituent contact to influence officials' votes. Because of this contact, elected officials may modify the external political environment of the corporation, resulting in a more favorable situation or avoidance of an undesirable political event (Aplin & Hegarty, 1980). Coordination with the efforts of other organizations can enhance the effectiveness of such activities. Collaborative action through industry associations often precedes constituency building and grass-roots lobbying by individual firms.

FIGURE 1
The Corporate Constituency Program: Processes, Activities, and Intended Effects



Constituency programs are particularly interesting to examine for several reasons. First, this political strategy appears to be growing in popularity. In 1980, fewer than 50 members of the Business Roundtable had engaged in constituency building activities (Business Roundtable, 1980), but two years later, 94 of the 191 member corporations reported having some type of a constituency program in operation, and 19 other members intended to initiate a program in the near future (Zeithaml et al., 1985). However, only 55 corporations had a constituency program that included shareholders. Most of these programs were very informal, communicating with shareholders on an irregular, ad hoc basis.

Second, despite this growth, there remains considerable disagreement in the corporate community concerning the feasibility and legitimacy of constituency building. Many corporations have avoided the strategy because they believe constituents' interests are too diverse, and that constituents are apathetic, would be difficult to motivate, and would react unfavorably to constituency-building efforts (Zeithaml et al., 1985). The first part of our research focused directly on these feasibility issues.

Third, among the commonly used political strategies, constituency programs often require the most substantial commitment of organizational resources. A well-organized constituency program involves significant temporal, financial, and human resources and often relies on numerous staff members and thousands of employees, shareholders, and other constituents, all of whom form an education and communication network. Conversely, lobbying, PACs, and advocacy advertising programs typically involve relatively few members of a corporate staff; organizations often use hired lobbyists, CPA firms, and advertising firms to implement such strategies and so minimize the involvement of organizational resources. The size of the resource commitment associated with constituency building makes strategy evaluation and subgroup identification, both issues of interest in this research, very relevant to corporations' strategic decision making.

Fourth, corporations have much larger potential constituencies than many other interest groups that rely heavily on constituency building. This is particularly true if shareholders can be mobilized into an active group of grass-roots lobbyists. However, many of the other interest groups that are dominated by single issues may be more homogeneous and easier to motivate.

Finally and, perhaps, most important, logic and a small body of empirical evidence (Aplin & Hegarty, 1980; Burson-Marsteller, 1981) suggest that constituent contact is the most influential form of political influence strategy. Logically, the systematic application of this strategy by the corporation should yield political returns when directed at officials seeking re-election. They should be responsive to the interests of their active constituents, since they would assume a high correlation between individuals' political activity and voting behavior. In cases where voters have disparate views on a specific issue, the politician may avoid taking a position on the disputed issue (Hayes, 1981). The politician's avoidance may mean a stalemate, rather than a loss for the constituent program.

Empirical support for the effectiveness of constituent contact comes from studies of congressional staffs conducted by Aplin and Hegarty (1980) and Burson-Marsteller (1981). They concluded that constituent feedback was the most effective political influence strategy — superior to, in particular, visits from Washington lobbyists or issue-advertising. Although these findings indicated that elected officials are responsive to grass-roots lobbying, they did not address the feasibility of developing active corporate constituencies to engage in these lobbying efforts. Because such issues require evaluation before the potential effectiveness of a constituency program may be ascertained, we initiated this research.

Shareholders as Corporate Constituents

Although virtually anyone can be a corporate constituent, only a subset of potential constituents represent viable candidates for an efficient corporate constituency program. Intuition suggests that initial constituency-building efforts should be directed at groups that identify strongly with the economic objectives of the corporation. The observation that individual shareholders possess attractive characteristics suggestive of their value as potential corporate constituents is consistent with this logic. These characteristics include the following:

1. Individual shareholders often are affected directly by public policies that influence the corporation.
2. Individual shareholders can be identified easily by the corporation, thereby facilitating the communication process.
3. Individual shareholders represent a large number of people (13,500 U.S. public companies have about 29 million shareholders).
4. The wide geographical dispersion of individual shareholders creates opportunities to influence a large number of elected officials.

Consequently, this research focused on the feasibility and effects of including individual shareholders in corporate constituency programs.

RESEARCH ISSUES AND HYPOTHESES

Actual performance reflects the effectiveness of any strategy. The complex nature of the political process in this country, however, makes it very difficult to discern the real effects of individual political strategies. Furthermore, sensitive practical and ethical considerations related to the measurement of constituent political activity complicate the task of evaluating strategies.

In light of these limitations, two questions, both related to the constituency program processes described above, became central to an assessment of the effectiveness of corporate constituency programs. First, are elected officials influenced by grass-roots lobbying? The preceding discussion suggests that the answer to this question is affirmative. Second, are corporations able to build, within practical resource constraints, active constituencies to engage in grass-roots lobbying? Although some corporations provide anecdotes suggesting their achievements in this area, many more corporations are uncer-

tain or clearly negative as to their potential for effective constituency building. In fact, a recent survey of corporate constituency programs indicated that virtually all respondents were dissatisfied with their ability to evaluate their constituency building efforts and uncertain as to their real impact (Baysinger, Keim, & Zeithaml, 1983). In view of these corporate doubts, we designed this research to provide empirical evidence related to the feasibility and impact of corporate constituency building among shareholders.

Four research hypotheses were used to address these issues, the first two focusing on general shareholder attitudes and program feasibility, the last two concerned with constituency program effects on shareholders attitudes. First, we propose that:

Hypothesis 1: Individual shareholders support corporate political activity and desire involvement in corporate political efforts.

Although general shareholder support may be useful, some corporations seek to identify and motivate constituent subgroups. Concerns for efficiency and the assumption that a small number of organized constituent contacts directed at key legislators may influence public policy outcomes prompt these efforts. Furthermore, corporations wish to avoid activities that contact potentially hostile shareholders, thereby risking financial or political alienation. The second research hypothesis, therefore, concerned the existence of significant within-group variance among shareholders:

Hypothesis 2: Significant differences exist between identifiable shareholder subgroups with respect to their attitudes toward the corporation and corporate political activity.

Three subgroup characteristics are relevant to this hypothesis: number of shares held, tenure as a shareholder, and employment status with the corporation. These characteristics are most appropriate if only because information on them is generally available to corporations.

Because direct behavioral outcomes are difficult to determine, the third research hypothesis focused on attitudinal differences among shareholders based on their exposure to corporate communication activities:

Hypothesis 3: Shareholders who have been exposed to corporate communications on public policy issues are more positive toward corporate political activity than shareholders who have not been exposed to this information.

The final research hypothesis compared certain attitudes of shareholders in the different corporations participating in the study:

Hypothesis 4: Shareholders who have received corporate communications on public policy issues through a formal and extensive constituency program will be more positive toward corporate political activity than shareholders who have received information from more limited corporate efforts.

METHODOLOGY

Sample and Survey Techniques

Approximately 20 U.S. firms were originally invited to participate in the study. After extensive negotiations, 6 major corporations agreed to participate, but requested anonymity. Table 1 presents a brief description of these firms.

Two characteristics of the participants made them especially appropriate for this exploratory research. First, as they represented three different industries—petroleum, chemicals, and forest products—they provided a diverse cross-section of shareholders that allowed a general evaluation of constituency program feasibility. (Future research should pursue specific differences among industries.) Second, the shareholder constituency programs operated by these corporations represented the range of programs found in previous surveys of large U.S. corporations (Zeithaml et al., 1985). Corporation I had a well-developed, 5-year-old program that communicated extensively and regularly with shareholders concerning public policy issues. More than 100,000 Corporation I constituents had joined the program and received monthly newsletters of six to eight pages describing upcoming issues that would affect the company, the positions of key politicians on selected issues, the political activities of the local chapters of this constituency program, and the activities of other politically active groups. Corporations II, III, and VI operated more typical shareholder constituency programs. They communicated irregularly with shareholders concerning public policy issues, supplementing their requests for action with very limited educational programs. Corporations IV and V had no identifiable constituency programs for shareholders. Once again, this range of programs was consistent with the exploratory objectives of this research.

Each corporation provided a sample of individual shareholders to be surveyed and financial support for the project. Table 1 outlines shareholder sample descriptions and statistics. Corporations II, III, and IV selected a random sample of 500 shareholders from all individual shareholders. Corporations V and VI selected a random sample of 500 shareholders from all individual shareholders plus an additional 300 annuitant shareholders. (These corporations had a particular interest in the attitudes of their annuitants.) Corporation I selected a random sample of 500 individual shareholders that were involved in its corporate constituency program. We limited Corporation I's sample in order to compare the effects of this sophisticated constituency program to the outcomes of the activities of the other corporations. Appropriate statistical measures—multivariate regression analysis with dummy variables—were taken to control for differences in composition of the samples.

After the initial development of the questionnaire, modifications were made based on a pretest and on extensive consultations with the corporations. Individual items were included to determine shareholders': (1) attitudes

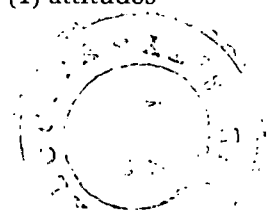


TABLE 1
Corporate Descriptions and Sample Statistics (1982)

Corporation	Product Lines	Sales (Millions)	Assets (Millions)	Individual Shareholders	Shareholders Receiving Questionnaire	Shareholders Returning Questionnaire	Response Rate (%)
I	Natural resources; petroleum refining and marketing, metals, and coal	26,462	21,633	192,000	500	282	56.4
II	Crude oil and gas; refining, transmission, and marketing	13,120	16,016	46,000	500	275	55.0
III	Crude oil and gas; exploration, refining, and transmission; chemicals and fertilizer	28,073	24,289	176,000	500	305	61.0
IV	Wood products and building materials; paper and packaging	2,912	2,663	53,000	500	351	70.2
V	Manufacturing and production of industrial, agricultural, and specialty chemicals; crude oil and gas; plastics	3,177	3,194	46,000	800	445	55.6
VI	Diversified manufacturing; engineering and construction services and materials; organic materials; forest products; metal products	1,675	1,193	18,000	800	493	61.6
				Totals:	3,600	2,151	59.8

toward the corporation in general, (2) attitudes toward corporate political activity, (3) attitudes toward specific corporate political strategies, (4) interest in corporate affairs, (5) exposure to the media, (6) preferences in corporate communication techniques, (7) political activity and preferences, (8) interest-group activity, (9) investment relationships with the corporation, and (10) general demographic characteristics.

The corporations were responsible for mailing a cover letter, the questionnaire, and a follow-up letter to all sample shareholders. The chairman of the board of each corporation wrote the cover letter inviting shareholder participation, but all cover letters were essentially identical. A total of 3,600 questionnaires were mailed to shareholders. As Table 1 indicates, response rates were comparable among corporations and sufficient to allow analysis of the data.

Analytical Techniques

A portion of the questionnaire focused on shareholder attitudes toward the corporation and corporate political activity. The responses to these 11 Likert-scale items provided empirical evidence relevant to the first research hypothesis. Factor analysis with varimax rotation was used to reduce the data and construct constituency-building indices, and the internal consistency of each index was evaluated with Cronbach's coefficient alpha. We calculated mean scores for each constituency-building index to quantify the attitudes of respondents, supplementing this information with data on their political and demographic characteristics.

The second research hypothesis concerned identification of differences among shareholder subgroups with respect to their attitudes toward the corporation and corporate political activity. We used two levels of analysis to provide empirical evidence for this hypothesis. First, a three-way analysis of variance employing three shareholder characteristics generally available to the corporation as classification variables—number of shares held, tenure as a shareholder, and employment status with the corporation—was used to determine whether significant attitudinal differences existed among subgroups of respondents. Comparisons were made with respect to the constituency-building indices developed above. Then, since this analysis did not identify which subgroups were most positive toward corporate political activity, we applied Duncan's multiple range test to identify significant differences and the rankings of the subgroups for each significant main effect.

The third research hypothesis suggested that shareholders who had been exposed to public policy information from any corporate source would be more positive toward corporate political activity than shareholders who had not been exposed to such information. Univariate *t*-tests and multivariate regression analysis with dummy variables were used to test this hypothesis. The *t*-tests identified significant differences between the mean scores of the exposed and not-exposed shareholder groups for each constituency-building

index. However, these tests did not take into account significant demographic differences between the groups that may have influenced the relationship between information exposure and shareholder attitudes. We used chi-square test statistics to identify demographic variables with significant between-group differences. Consistent with an approach recommended by Cohen (1968) and by Cohen and Cohen (1975), multivariate regression analysis with dummy variables was then used to determine the relationship between exposure to public policy information and the value of each constituency-building index. Demographic variables for which there were significant differences were included as independent variables in each regression to account for these differences between shareholders.

The final research hypothesis concerned the impact of a constituency program on shareholders attitudes. As mentioned above, Corporation I was the only corporation with a well-developed program. We used one-way analysis of variance to determine whether significant differences existed between the shareholders of each corporation with respect to the constituency-building indices, and applied Duncan's multiple range test to identify the source of these differences. As in the analysis for the third hypothesis, these tests did not control for significant demographic differences between Corporation I shareholders and shareholders of the other five corporations. Chi-square tests were used to identify demographic variables for which there were significant differences. Once again, multivariate regression analysis with dummy variables was appropriate to test whether a significant relationship existed between shareholder membership in Corporation I and each constituency-building index. We included a Corporation I membership variable and demographic variables for which significant differences were found as independent variables in the regressions described above, thereby testing Hypotheses 3 and 4 simultaneously.

RESULTS

Tables 2–6 contain the results of the statistical analyses. A total of 2,151 usable questionnaires were returned, for a response rate of 59.8 percent. Table 2 reports the results of the factor analysis with the relevant items from the questionnaire. Three factors emerged from the analysis and were used as constituency-building indices throughout the research. The indices were labeled and defined as follows: (1) credibility—shareholder attitudes concerning the credibility of corporate management; (2) legitimacy—shareholder attitudes concerning corporate political activism in general; (3) shareholder involvement—shareholder attitudes concerning their own involvement and participation in the political activities of the corporation.

We intuitively assessed these factors to be vital components of an effective constituency-building effort; the literature on social performance (Freeman, 1983; Sonnenfeld, 1981) also supports their importance. Shareholders should view corporate management as a credible source of information, support the political activities of the corporation, and desire information and involvement. Although the internal reliabilities (Cronbach alphas)

TABLE 2
Constituency Building Items: Results of Principal Components Factor Analysis^a and Summary of Responses

Items ^b	Credibility	Legitimacy	Shareholder Involvement	Percent Agree ^c	Percent Neutral/No Opinion	Percent Disagree ^d
Believe proxy information	.83	.09	.01	91.2	6.3	2.5
Believe management forecasts	.79	.04	.00	94.5	4.0	1.5
Shareholders kept well informed	.73	.00	.12	90.6	6.5	2.9
Agree with company public policy statements	.55	.30	.31	64.8	28.5	6.7
Agree with proxy recommendations	.53	.17	.04	85.2	9.2	5.6
Company executives should speak out on public policy issues	.16	.85	.13	84.2	8.5	7.3
Company should advertise public policy issue positions	.00	.80	.26	68.7	15.6	15.7
Company should make campaign contributions	.35	.46	.21	61.0	11.1	27.9
Company should provide shareholders with politician voting records	.01	.11	.81	57.8	20.9	21.3
Company should provide shareholders with public policy information	.01	.21	.78	75.6	16.7	7.7
Company should influence legislation	.20	.18	.60	77.0	14.2	8.8
Variance explained	32%	17%	9%			
Cronbach alpha	.76	.65	.65			

^aWith varimax rotation.

^bAll items were rated on 5-point Likert scales, ranging from 1 = "strongly disagree" to 5 = "strongly agree".

^c"Percent agree" represents percent of respondents who scored item "strongly agree" or "agree."

^d"Percent disagree" represents percent of respondents who scored item "strongly disagree" or "disagree."

of the legitimacy and shareholder involvement indices were somewhat lower than desired, they seem acceptable for an exploratory effort; subsequent research should improve upon these scales. In addition, it should be noted that a questionnaire printing error made by Corporation VI made it impossible to calculate a credibility score for that firm. Therefore, sample sizes for any analysis involving the credibility index were consistently lower. Other sample size discrepancies were due to occasional missing data in returned questionnaires.

Hypothesis 1: Results and Discussion

The results presented in Table 3 indicate support for the first hypothesis, which suggested that individual shareholders support corporate political activity and desire involvement in these activities. On a 5-point Likert scale, the mean response for each constituency building index was 3.90 or higher (a response of 3 on the items composing these indices indicated "neutral" or "no opinion"). Therefore, the respondents generally viewed management as credible, believed corporate political activity to be legitimate, and desired some level of involvement. The indices also yielded significant, positive intercorrelations.

TABLE 3
Summary of Shareholder Attitudes: Means, Standard Deviations, and Intercorrelations

Constituency Building Indices ^a	Mean	s.d.	n	Correlations	
				2	3
1. Credibility	4.31	.57	1,583	.40*	.27*
2. Legitimacy	3.90	.92	2,103		.46*
3. Shareholder involvement	3.94	.87	2,093		

^aEach index summarized shareholder responses to items rated on 5-point Likert scales, ranging from 1 = "strongly disagree" to 5 = "strongly agree."

* $p < .01$

Since this hypothesis concerned an overall evaluation of shareholder attitudes toward corporate political activity, the responses given to several other items on the questionnaire were of interest. When asked directly whether they wanted the corporation to provide them with analysis of key public policy issues, 90 percent of the respondents desired such information. Although the responses are subject to self-report bias, the respondents appeared to be well-informed and politically active. Over 90 percent watch network news at least three times a week and read a newspaper daily, 67 percent watch a weekly news program (e.g., *Meet the Press*) at least once a month, and over 60 percent regularly read a national news magazine. Approximately 96 percent of the respondents indicated that they voted in the 1980 presidential election (compared to 53 percent of the eligible voter population), and over 94 percent reported voting in the last congressional election. Almost

50 percent of the respondents were college graduates, and over 35 percent had annual incomes over \$40,000. Finally, 30 percent of the respondents were retired persons or homemakers. Since constituent activity requires some commitment of time, such shareholders may be more likely to participate in a corporate program.

These general descriptive results suggested a shareholder profile that we intuitively judged to be consistent with corporate constituency-building needs. The respondents were predisposed to support corporate political activity, were interested in the corporate viewpoint, and demonstrated characteristics that prepared them for a role in the constituency program of the corporation. Although these results may seem fairly straightforward, they contradict many of the perceptions held by public affairs executives (Zeithaml et al., 1985). The remainder of the study focused on differences among various groups of respondents.

Hypothesis 2: Results and Discussion

The second hypothesis focused on the identification of attitudinal differences among subgroups. Tables 4 and 5 contain the analysis of variance and Duncan's test results. Three shareholder characteristics commonly available to the corporation were used in the analysis. Table 4 reveals that there were no significant interaction effects. Significant main-effects differences were found for all three characteristics with respect to the credibility index. Two significant main-effect differences—number-of-shares-held and employment status with the corporation—were identified for the legitimacy index. Number-of-shares-held was the only difference for the shareholder involvement index. Table 5 indicates that larger shareholders placed greater credence in corporate management, demonstrated stronger support for corporate political activity, and were more favorable toward shareholder involvement. Shareholders with longer tenure had a more positive view of management credibility. Annuitants, shareholders who had retired from the corporation, scored highest on the credibility and legitimacy indices and were significantly different from other groups.

Although shareholders in general were favorable toward corporate political activity, this analysis indicated differences within the group of shareholders that may allow a corporate constituency program to focus its efforts, thereby gaining efficiency. As we might have predicted, larger shareholders and corporation annuitants represented high-potential market segments where corporate political activity should expect a positive reception. Knowledge of other shareholder characteristics should allow corporate constituency programs to focus their activities to a greater degree than they have previously. For example, additional analysis revealed that older shareholders who derive a large percentage of their incomes from corporate dividends scored very high on all three indices. Conversely, shareholder subgroups that reported education beyond initial college degrees were somewhat less supportive of corporate political activity. Corporations may attempt to gather such data to focus

TABLE 4
Results of Analyses of Variance of Shareholder
Characteristics

Source	Dependent Variables								
	Credibility			Legitimacy			Shareholder Involvement		
	df	MS	F	df	MS	F	df	MS	F
Number of shares (N)	5	59.7	7.78***	5	71.9	9.77***	5	19.6	2.85*
Shareholder tenure (T)	5	27.2	3.55**	5	2.6	.35	5	7.1	1.04
Employment status (E)	3	73.5	9.58***	3	37.7	5.12**	3	5.4	.78
N × T	22	8.3	1.08	23	5.9	.76	23	5.0	.72
N × E	15	12.2	1.59	15	11.0	1.49	15	3.0	.44
T × E	13	11.4	1.48	14	9.6	1.30	14	8.8	1.29
N × T × E	34	7.3	.95	46	6.2	.84	47	5.6	.81
Error	1403	7.7		1883	7.4		1878	6.9	

*p < .05

**p < .01

***p < .001

their efforts even further, perhaps through a constituency program enrollment survey. However, the costs and benefits associated with such refinements should be carefully evaluated. As the following sections suggest, a constituency program itself may have a meaningful impact on the attitudes of all shareholder groups.

Hypothesis 3: Results and Discussion

The third hypothesis concerned significant attitudinal differences between respondents who had been exposed to public policy information from any corporate source and respondents who had not been exposed to such information. Approximately 68 percent of the respondents acknowledged receiving public policy information from corporations, most of it in annual reports and infrequent, ad hoc communications, rather than from formal, well-organized constituency programs. The results of the t-tests indicated only one significant mean difference between these groups: Respondents who had been exposed to public policy information agreed more strongly than the other group that corporate political activity was legitimate.

These tests however, did not control for demographic differences between the groups. The chi-square tests found 11 significant demographic differences between the exposed and not-exposed groups. We dummy-coded the classes of these demographic variables and entered them as independent variables into a regression equation along with the information-exposure variable. As indicated in Table 6, this analysis revealed a very strong association between information exposure and legitimacy, and a significant relationship between information exposure and shareholder involvement. No association was found between information exposure and credibility. Since the

TABLE 5
Results of Duncan's Multiple Range Tests of Shareholder Characteristics

Constituency Building Index	Rank	Number of Shares			Tenure as Shareholder			Employment Status					
		Subgroup	n	Mean	Duncan Test Results ^a	Subgroup	n	Mean	Duncan Test Results ^a	Subgroup	n	Mean	Duncan Test Results ^a
Credibility	1	1500-2500	60	4.51	A	>20 yrs.	344	4.44	A	Annuitant	144	4.51	A
	2	1000-1499	67	4.50	A	16-20	165	4.36	B	No association	1112	4.31	B
	3	>2500	49	4.43	B	6-10	381	4.29	C	Employee	147	4.27	C
	4	500-999	167	4.40	B	11-15	286	4.25	D	Former employee	137	4.05	D
	5	100-499	670	4.31	C	1-5	313	4.23	D				
	6	0-99	536	4.21	D	<1 yr.	65	4.11	E				
Legitimacy	1	>2500	78	4.26	A					Annuitant	370	4.03	A
	2	1500-2500	79	4.25	A					No association	1349	3.90	B
	3	1000-1499	88	4.17	B			n/a ^b		Employee	180	3.75	D
	4	500-999	237	3.96	C					Former employee	157	3.67	D
	5	100-499	865	3.89	C								
	6	0-99	707	3.77	D								
Shareholder involvement	1	1000-1499	89	4.18	A								
	2	1500-2500	79	4.11	B								
	3	>2500	79	4.06	B								
	4	500-999	235	3.97	C			n/a ^b				n/a ^b	
	5	100-499	859	3.91	C D								
	6	0-99	705	3.90	D								

^aShareholder subgroups with the same letter in this column are not significantly different from each other ($p < .05$).

^bDuncan's test was not applicable where the ANOVA F value was not significant ($p > .05$).

TABLE 6
Results of Regression Analyses of Constituency Building Indices
on Demographic Variables, Information Exposure,
and Corporation I Membership

Independent Variables	Dependent Variables ^a		
	Credibility	Legitimacy	Shareholder Involvement
Political party	-.07	-.12	-.09
Occupation	.06	-.02	.00
Household income	.04	.05	-.10*
Age	.55***	.23***	-.01
Marital status	.12	-.03	.01
Education	-.23***	.00	-.22***
Company employment status	-.18*	-.05	-.08
Tenure as investor	.03	-.07	-.08
Tenure as corporation shareholder	-.04	-.02	.06
Number of corporation shares	.18*	.27***	.13*
Corporation shares: percent of portfolio	.03	-.02	-.01
Dividends: percent of income	.02	.04	.08*
Information exposure	-.05	.70***	.33*
Corporation I membership	.05	.36	.59**
	R ² = .14	R ² = .06	R ² = .04
	F _{14,1267} = 14.34***	F _{14,1688} = 7.97***	F _{14,1682} = 5.30***

^aStandardized coefficients reported

*p < .05

**p < .01

***p < .001

purpose of this analytical approach was to test selected relationships (information exposure with the three constituency-building indices), the relatively low values of R^2 should not be viewed as a problem. Furthermore, strict interpretation of the other independent variables is largely inappropriate, since they were included only as covariates.

This analysis suggests that communicating with shareholders may have a positive effect on their attitudes toward corporate political activity—shareholders may not only be a receptive audience, but one that can be influenced. The following section examines the relationship between a systematic constituency-building program and shareholder attitudes.

Hypothesis 4: Results and Discussion

The final hypothesis focused on the issue of whether attitudes of Corporation I shareholders differed from attitudes of shareholders of other corporations. The analysis of variance and Duncan's tests found significant differences for each constituency-building index. The attitudes of Corporation I respondents were the most positive on the three indices, and were significantly different from the attitudes of all other corporation shareholders, with the exception of Corporation III respondents on the legitimacy index. It

is interesting that Corporation III had previously made some limited attempts at shareholder constituency building.

Once again, these tests did not control for demographic differences among respondents of the various corporations. It was particularly important to account for such demographic differences in this comparison, to reduce the possibility that the constituency program simply attracted a very different type of shareholder who tended to be more positive toward the corporation because of some other characteristic. The chi-square tests comparing Corporation I respondents with those of other corporations found significant differences on seven demographic variables, which were coded and included in the regression equations with a variable representing Corporation I membership. As reported in Table 6, Corporation I membership produced a significant positive effect on the shareholder involvement index, but produced no significant effect on the credibility index, although it was marginally significant at the $p < .07$ level for the legitimacy index. While the R^2 s were low and certain demographic variables attained significance, these issues are not central to the aims of this research.

The results suggest that members of the constituency program operated by Corporation I were more positive toward corporate political involvement than were shareholders of other corporations. The analytical approach taken attempted to control for the possibility that a different type of shareholder may join a constituency program to the degree possible with cross-sectional data. Regardless of the reason, the constituency program of Corporation I identified and educated respondents who were more favorable toward corporate political activity and involvement than were other respondents, and appears to have been successful as a result.

SUMMARY AND CONCLUSIONS

This research was designed to assess the feasibility and effects of including shareholders in corporate constituency programs. Although the study focused on shareholder attitudes and within-group differences in these attitudes rather than behavioral responses, the major conclusion of the research is that substantial potential exists for effective corporate constituency programs aimed at shareholders, as results suggest that shareholders tend to perceive corporate management as a credible source of information, with or without public policy communications, to support corporate political activity, and to be willing to become involved in constituency programs. Future research supplementing and extending these findings should include longitudinal evaluations of ongoing constituency programs and analysis of shareholder behavioral responses to program activities.

Furthermore, shareholders who have been exposed to public policy information from a corporation, particularly one with regular communications through a formal, well-developed constituency program, appear to be more positive toward corporate political activity and involvement than do shareholders who lack such exposure. Critics of constituency programs who argue

that public policy communications will stimulate hostility and negative reactions from shareholders should review their positions, as this study indicates an opposite effect on shareholder attitudes, and particularly on their own involvement. Public policy communications neither enhanced nor undermined respondent perceptions of management credibility, which remained at a very high level. As an aside on this point, there were no hostile comments or letters returned with the 2,151 completed questionnaires, despite some rather personal and sensitive items. To the contrary, some respondents requested a greater role in corporate political affairs and more information on public policy issues. Corporations that have planned or implemented constituency programs should be encouraged by these results.

In a different vein, the results offer some insights on several theoretical issues. First, although most shareholders may have little interest in the internal management of their corporations, they may be a useful resource for the environmental management activities of the firm. The results of the study indicated that individual shareholders appear to be more politically active than the general public. A constituency program, by providing shareholders with additional information on political issues of importance to the company, may help concentrate the political activity of shareholders on issues and politicians most relevant to the objectives of the firm. This suggests that the management-shareholder relationship should be restudied and modified.

Second, previous research has implicitly treated shareholders as a homogeneous group. The results presented here indicate that shareholders may differ significantly in a number of ways. For example, if other differences were to include varying shareholder attitudes toward risk, dividends, retained earnings, and mergers, corporate management might find it useful to evaluate the composition of its shareholders before making critical decisions. Research examining attitudinal differences among shareholders as a function of demographic characteristics may be particularly important for developing environmental management strategies.

A third issue of interest for future research should be the investments required for an effective, action-oriented constituency program. Although constituent education and motivation programs are necessary to acquaint shareholders with specific public policy issues and to provide them with timely messages to prompt action, the generally favorable attitudes of shareholders may reduce the incremental benefits associated with some high-cost activities. Research that analyzes the effects of subgroup differences and various communication techniques on attitudes and behavioral responses should prove useful.

Although considerable research is still required to understand and promote the effective management of corporate political activity, this study was intended to provide a building block for future work in the area. Political strategists should be encouraged by the fact that a strategy dependent on third-party participation appears to be feasible. Proper management of corporate constituency programs may develop a resource that contributes to the political and economic goals of corporations and their constituents.

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A CLOSER LOOK AT HALO ERROR IN PERFORMANCE RATINGS¹

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This study focused on conceptualizing and measuring a particularly pervasive form of rating error—halo. Longitudinal data were analyzed to assess the relationship between rater-ratee familiarity and halo error, and the degree of congruency among four of the five common measurements of halo error. Participants included over 1,000 students who evaluated 14 faculty members. Results indicated that as raters' opportunities to observe ratee behavior increased, so did the magnitude of halo error, and that the four measures of halo error were consistent over time. Implications for training strategies that advocate increased observation by raters of ratees are discussed.

Over the last seventy years, researchers in the field of performance appraisal have devoted a great deal of attention to the problems of inadvertent judgmental biases that seem to be an inherent feature of rating processes and outcomes. Despite efforts directed toward the development of rating procedures, instrument formats, and rater training techniques designed to minimize these biases, and the early optimism that greeted each new development, our control of these errors has not advanced far beyond the accomplishments of early pioneers in the field (Bernardin & Pence, 1980; Borman, 1979; Jacobs, Kafry, & Zedeck, 1980; Landy & Farr, 1980). This lack of progress may be related in part to the fact that, with few exceptions (Cooper 1981; Saal, Downey, & Lahey, 1980), a basic consideration has been consistently overlooked in the literature. Researchers have failed to directly address the criteria by which we judge the adequacy and quality of ratings. As a result, we are largely ignorant of the nature and dynamics of the biases that are regarded as the principal liabilities of ratings. This study seeks to shed some light on one particularly troublesome types of rating error—halo.

Halo error is the longest recognized, most pervasive, and yet least understood (Nisbett & Wilson 1977) form of rating error. Early identification of the phenomenon is attributed to Wells (1907) and Webb (1915), but Thorndike (1920) is credited with naming it halo. He characterized the error as a strong tendency by the rater to "think of the person in general as rather good or

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rather inferior and to color the judgment of the separate qualities by this general feeling" (1920: 25). The implication is that an overall impression causes or forces the ratings of separate dimensions to be consistent with a global evaluation, even when the rater has sufficient information to render independent judgments of the dimensions (Nisbett & Wilson, 1977). Subsequent descriptions of halo error largely retained the flavor of Thorndike's definition (Bernardin, 1977; Borman, 1975; De Cotiis, 1977; Guion, 1965; Saal et al., 1980), although a somewhat different perspective has also been delineated.

The second perspective views halo as arising from the rater's implicit assumptions about covariance among dimensions (Newcomb, 1931) rather than from the direct influence of a global assessment of the individual being rated (Nisbett & Wilson, 1977). According to this view, the greater the conceptual similarity among performance dimensions in the minds of raters, the greater the degree of halo error. Cooper (1981) suggests that raters are incapable of distinguishing veridical covariance among performance dimensions (Bingham, 1939) from that imparted by their implicit assumptions. Thus, they tend to overstate the true covariance of dimensions in judging performance, thereby increasing halo. The contribution of raters' global assessments to halo error is unclear within this framework. To the extent that the rated performance characteristics are regarded as conceptually similar, presumably overall evaluations operate in much the same manner as Thorndike hypothesized; that is, the overall evaluation is expected to be linked to the separate dimension ratings. It remains unclear whether the overall assessment forces consistency in the dimension ratings or whether the ratings on conceptually similar dimensions force consistency in the overall evaluation of the individual.

Because of its pervasiveness, halo error has long been considered a principal liability of judgmental ratings. In an effort to reduce or minimize halo bias, numerous rating methods, instrument formats, and rater training techniques have been developed. An assumption which cuts across many of these strategies is that increased observation of performance-relevant ratee behavior will reduce halo error and thus maximize the veridicality of subsequent ratings (Bernardin & Walter, 1977; Latham & Wexley, 1981; Spool, 1978). This assumption rests on the conviction that global impressions are likely to be stronger sources of judgments on performance dimensions when the rater lacks performance-relevant information on the ratee (Borman, 1974; De Cotiis, 1977; Freeberg, 1969; Thorndike & Hagen, 1961; Wherry, 1952). The logic of this assumption is quite straightforward; raters who have differential or limited opportunities to observe ratee performance are likely to rely on more general expectancies when providing judgments of dimensions for which they lack specific information (Friedson & Rhea, 1965).

How does such observation reduce halo? The assumption seems to be that it should help to differentiate the general impression by providing dimension-specific information that may be at variance with it. Thus, the rater who observes the ratee longer should have a more highly differentiated

mnemonic base of the performance-relevant behaviors characteristic of the ratee. However, Nisbett and Wilson (1977) reported that a general impression or evaluation may be so strong that dimension-specific information discrepant from it will be ignored by the rater. Indeed, they suggest that a general impression may alter perceptions of information about specific dimensions in a direction consistent with that impression. Since general impressions are thought to be formed relatively quickly (Webster, 1964), clarification is required regarding the causal connections between overall evaluations, ratings on specific dimensions, and rater observations or familiarity with ratees.

Direct empirical evidence on this issue is virtually nonexistent, in spite of the centrality of the assumption for methods of controlling halo. Indeed, most of the support cited for the efficacy of familiarity in reducing halo is deduced from measurement theory. Several studies have reported positive relationships between rater-ratee familiarity (variously defined) and rating scale reliability and validity (Ferguson, 1949; Hollander, 1954, 1957; Kornhauser, 1926).¹ If reliability and validity increase with familiarity the presumption is that all forms of error bias must be correspondingly reduced. Recent evidence suggesting possible positive correlations between rating accuracy and halo (Cooper, 1981) question this reasoning.

Moreover, studies that directly address the effects of rater-ratee familiarity on halo have generally framed the question in terms of an affective or evaluative orientation ("how well do you know" or "how well do you like" the ratee) (Brown, 1968; Koltuv, 1962), rather than with an operationalization that indicates actual performance-relevant contact like length or frequency of contact. Thus, the support provided by such studies for the commonly held view that familiarity and halo are negatively related is questionable. Indeed, we located only one study that addressed the relationship between halo error and rater-ratee familiarity in which familiarity was temporally defined. In this cross-sectional study, Knight (1923) reported substantial increases in halo with increasing lengths of acquaintance between raters and ratees. This finding is contrary to the conventional wisdom and, together with the previously enumerated points, suggests that a closer look at halo error is needed.

Our arguments can be summarized as follows: Techniques designed to minimize halo error in performance ratings have not proven efficacious. An assumption underlying these strategies — that greater amounts of observation by raters of performance-relevant ratee behavior ought to reduce halo — is based upon intuitively appealing logic, but weak empirical evidence.

This study was designed to (1) address the relationship between rater-ratee performance-relevant contact and halo error by examining halo in longitudinal ratings, and (2) examine the performance of various measures of halo error over time in an effort to better delineate their covariation.

¹Note that even this relationship is not unequivocal—see Hollander, 1956; Love, 1981; Mays, 1954; and Moore, 1937 for conflicting evidence.

METHODS

Subjects

Participants in this study were drawn from students enrolled in fifteen regularly-scheduled undergraduate psychology courses. The students served as raters of their instructors, who were the ratees. Ratings were conducted at three times — during the first, fifth, and tenth weeks of a ten-week term. The number of student raters participating in the three rating periods were 1031, 976, and 876, respectively.

Rating Form

Raters provided evaluations of their instructors on nine dimensions of faculty performance identified by Harari and Zedeck (1973): ability to motivate, delivery, depth of knowledge, grading, organization, relations with students, relevance, testing, and work load. Raters also provided a separate overall evaluation of their instructor. The rating form listed each dimension and its definition, and included a seven-point rating scale of performance with four anchors: very low, below average, above average, and very high. A conventional rating scale was employed because we did not wish to restrict halo effect by using a format designed to inhibit its expression. Raters were instructed to read each dimension title and definition and to provide a rating. They were further instructed to supply a "best guess rating given your knowledge of your instructor" for those dimensions, such as testing and grading, about which they might lack appropriate information. These instructions provided a maximal opportunity for halo to occur. To further encourage the emergence of halo, the first set of ratings was obtained after one or two class meetings. Thus, raters provided performance judgments with minimal relevant contact and instructions to make ratings based on their expectations (i.e., global evaluations) when they lacked appropriate information. Ratings made at each time period were matched on anonymous code numbers. These procedures yielded 874 raters across the three measurement periods; 610 raters provided complete sets of ratings.

Indices of Halo

A serious problem in investigating halo error is that numerous investigators have employed different indices of halo (Saal et al., 1980). By far the oldest indicator (Rugg, 1922; Thorndike, 1920) is the presence of moderately high to high values in the intercorrelation matrix of rating dimensions. A second and related indicator examines the results of a principal components or factor analysis of this matrix (Ritti, 1964; Kraut, 1975). The fewer the factors that emerge relative to the number of a priori dimensions, the greater the degree of inferred halo error. A third approach focuses on the variance or standard deviation of a single rater's ratings of a ratee across performance dimensions (Bernardin, 1977; Bernardin & Pence, 1980). Smaller standard deviation or variance estimates are regarded as indicative of greater levels of halo error, since they reflect a unitary conception of the ratee. A fourth

strategy attempts to control halo statistically by partialling out an overall rating or factor from the dimension ratings (Holzback, 1978; Koltuv, 1962; Landy, Vance, Barnes-Farrell, & Steele, 1980). Since Thorndike's (1920) definition of halo effect implies that the overall judgment of an individual affects ratings of separate dimensions, statistically removing the overall rating reduces the magnitude of intercorrelations among dimensions to the extent that ratings of separate dimensions are congruent with the overall judgment. Thus, a first-order partial intercorrelation matrix with values smaller than the zero-order matrix is presumed to reflect a halo-free matrix. Finally, a fifth strategy is based on Guilford's (1954) analysis-of-variance method, in which a significant rater \times ratee interaction is regarded as indicative of halo (Brown, 1968; Burnaska & Hollmann, 1974).

Saal et al. (1980) have suggested that different measures of halo may provide very different conclusions, because each deals with a somewhat different aspect of the phenomenon. For this reason, with the exception of the ANOVA method,² all of the enumerated indicators of halo were employed in the study. Although there is no direct comparability among the measures, we reasoned that a convergence among them would support stronger conclusions than the use of any single indicator.

Analyses

Methods of data analysis employed were chosen to assess the amount of halo error present in the multidimensional performance ratings. By measuring halo at each of the three time periods and by using four of the procedures identified above, it was possible to investigate (1) the relationships between familiarity and halo, and (2) the degree of congruency among four measures of halo.

The four measures of halo were: (1) To determine intercorrelations among dimensions, a data matrix with raters as rows and dimensions as columns was analyzed; the resulting 9×9 correlation matrix itself was the focus of study. (2) For the method involving factor or principal components analysis, the matrix of intercorrelations among dimensions was subjected to principal components analysis. (3) Standard deviations of ratings across dimensions by single raters were obtained by calculating a standard deviation of the nine dimension ratings (excluding the overall rating) for each row of our initial data matrix. (4) First-order partial correlations were obtained by partialling each rater's overall evaluation from the dimension ratings and calculating the resulting intercorrelation matrix.

Each of these four analyses was conducted on the performance rating data for all three time periods. By viewing this study as a 3×4 design (three time periods by four halo measures) it becomes apparent that the relationship between familiarity and halo can be investigated by comparing the halo

²Not all raters rated all ratees in the study; thus, we lacked the complete data matrix to use this method.

measures over the time factor. The convergence of measures can be assessed by examining whether the four measures behave similarly over time.

RESULTS

Table 1 provides summary data, means and standard deviations for the ten ratings at each of the three time periods. Table 2 provides the relevant summary information for each of the measures of halo at each of the time periods.³

TABLE 1
Means and Standard Deviations of Ratings by Time Periods

	Week 1 (n = 1031)		Week 5 (n = 976)		Week 10 (n = 876)	
	\bar{x}	s.d.	\bar{x}	s.d.	\bar{x}	s.d.
Depth of knowledge	5.5	1.0	5.5	1.1	5.5	1.1
Delivery	5.0	1.2	4.6	1.4	4.5	1.4
Organization	4.8	1.1	4.5	1.3	4.4	1.4
Interpersonal relations	5.2	1.1	4.9	1.3	4.9	1.3
Relevance	5.0	1.1	4.8	1.3	4.8	1.3
Testing	4.5	0.9	4.4	1.3	4.5	1.3
Grading	4.6	0.9	4.6	1.3	4.7	1.2
Assignment and workload	4.6	1.0	4.5	1.2	4.6	1.2
Inspiration and motivation	5.0	1.1	4.6	1.4	4.5	1.3
Overall evaluation	5.2	1.0	4.8	1.2	4.9	1.3

TABLE 2
Summary Data for Four Indicators of Halo
Measured at Three Time Periods

Measures of Halo	Week 1	Week 5	Week 10
1. Mean intercorrelations among dimensions (Fisher's r to z transform)	.45 (.43) ^a	.55 (.54) ^a	.58 (.59) ^a
2. Principal components analysis:			
Number of components with eigenvalues ≥ 1	2	1	1
Percent of variance accounted for by the first component	49.50	59.90	63.70
3. Mean standard deviation across dimensions (within raters)	.74	.69	.67
4. Mean partial correlations with overall rating removed (Fisher's r to z transform)	.14	.14	.15

^aValues in parentheses represent mean intercorrelations among dimensions for the 610 subjects who provided ratings at all three time periods.

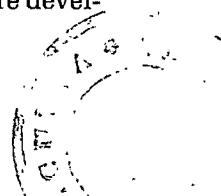
³A copy of the three matrices of intercorrelations among dimensions can be obtained from the senior author.

With respect to familiarity and halo, the data show that when raters have a greater opportunity to observe ratees' performance and thus become more familiar with the behavior to be rated, halo tends to increase. This increase is seen in the increasing values of intercorrelations among dimensions: for the analyses involving all subjects, mean correlations of .45, .55, and .58 were obtained for time periods 1, 2 and 3, respectively; for the analyses using only those raters providing data at all time periods, mean correlations of .43, .54, and .59 were obtained. It is also evidenced by the decreasing magnitudes of the standard deviations across dimensions, and in both measures associated with the principal components analysis. Statistical tests applied to these data took two forms. First, a one-way analysis of variance was conducted comparing the standard deviation measures for the three time periods. The resulting *F* value of 8.85 was significant ($p < .01$; $df = 2,540$). Next, an analysis of the equality of the three 9×9 covariance matrices calculated for each time period was performed. The resulting likelihood ratio (Barlett, 1947) was significant with a $\chi^2 = 295.91$ ($p < .01$; $df = 90$).

As was described earlier, halo error has been investigated through first-order partial correlations, controlling for the overall evaluation. The last row of Table 1 gives the results of such an analysis and shows that the partial correlations are approximately equal across the three time periods. While this equality might suggest that the halo index does not reflect increasing amounts of halo over time, as the other halo measures have shown, a more detailed examination of this result leads to a different conclusion. When row 4 is compared to row 1 of Table 1 it becomes clear that although the partial correlations are similar over the three periods, greater amounts of covariation attributable to the overall evaluation are removed in the earlier time periods (i.e., the difference between .45 and .14 for time period 1 < the difference between .58 and .15 for time period 3). Halo error is actually increasing over time since the overall evaluation is a stronger correlate of dimension ratings at time 3.

An additional analysis of the partial correlations was performed. As in the likelihood ratio test applied to the covariance matrices, the partial matrices were analyzed using the Bartlett test. The anticipated outcome of equality was not supported, indicating that there were significant differences between the profiles of partial correlation matrices across the three time periods even though variations in means were small (.14, .14, .15; $\chi^2 = 204.34$, $p < .01$, $df = 90$). This result calls into question the usefulness of traditional measures of halo and indicates the need to examine halo in a more comprehensive and rigorous fashion. It also clearly points out that halo error is multidimensional and that simplistic conceptualizations are therefore inadequate.

With respect to the convergence of the measures of halo, Table 2 shows that all indices of halo behaved similarly over time. While it is impossible to directly compare these measures within a single time period because they lack a common metric, a comparison of the patterns that each measure devel-



ops over time makes it apparent that the four measures of halo reflect the same underlying process in this set of data.

DISCUSSION

With respect to familiarity between raters and ratees, the results of this short-term longitudinal research are consistent with those of a cross-sectional study conducted by Knight (1923). When familiarity is operationalized temporally, the amount of halo present in ratings increases with increasing familiarity. Although the effect was significant when statistical tests were applied (χ^2 and F), the percentage of variance accounted for, as measured by ω^2 : (Hays, 1973: 485) was only .03. What is important about this result is that it is in the opposite direction to the logically and intuitively sensible expectation that greater familiarity between rater and ratee should increase opportunities for raters to observe performance-relevant behaviors of ratees. It follows that a major outcome of greater opportunities to observe larger samples of ratee behaviors ought to be less halo error and more veridical subsequent ratings. Such expectations have been expressed by numerous scholars (Borman, 1978; Campbell, Dunnette, Arvey, & Hellervick, 1973; Freeberg, 1969; Thorndike & Hagen, 1961; Wherry, 1952). Limited support for them was provided by Brown (1968) and Koltuv (1962) who — contrary to results of the present study — reported that greater degrees of familiarity were associated with significantly less halo in multidimensional trait ratings.

These contradictions are, on the surface, disturbing. However, a more detailed analysis of the previously cited research reveals that these outcomes are not as discrepant as first suggested. The notion of increased familiarity resulting from more observations by raters of samples of performance-relevant behaviors by ratees strongly implies a temporal component involving observations over time. The studies of Brown (1968) and Koltuv (1962) are deficient in their conceptualizations of familiarity. For example, Koltuv operationalized familiarity as a rating on a seven-point scale anchored by "known" and "don't know." It is clear that this familiarity measure minimizes the temporal component, bearing a strong resemblance to an affective, rather than a temporal conceptualization of familiarity. Brown's measure of familiarity suffers from even greater limitations. Indeed, she refers to it both as "familiarity" and "relationship intensity." Moreover, the degree of familiarity is confounded by the term "liking" in her study.

One alternative explanation of our results regarding halo and familiarity is that they are a spurious outcome of increasing reliability. After all, the rating scale anchors were somewhat ambiguous and, in the initial rating period, raters lacked relevant performance information about their ratees. Perhaps they made somewhat random or capricious ratings initially, but as they gained more performance-relevant information over time, their ratings converged. A by-product of increased convergence would have been lower levels of reliability at time 1 and higher levels at times 2 and 3, with a resulting spurious increase over time in the apparent halo. However, an

examination of the three vectors of standard deviations in Table 1 indicates that raters showed either equivalent or lower levels of interrater agreement (standard deviations within dimensions) over time. This fact indicates that, if anything, reliability of ratings as assessed by interrater agreement either remained constant or was reduced over time. Thus, increased reliability over time cannot serve as an explanation of the results. If anything, our results may err on the conservative side.

We do not mean to imply that length and frequency of observations of ratee behaviors are unrelated to the accuracy of ratings. Rather, we believe that the relationship between observations and accurate ratings is more complex than most practitioners and researchers have assumed. For example, implicit in the notion that increased behavioral sampling leads to greater rating accuracy is an assumption that halo is antithetical to veridical ratings. The assumption that greater familiarity leads to less halo and thus to greater accuracy underlies the conclusions of Brown (1968) and Koltuv (1962). The same assumption underlies the strategies incorporated in rater training programs, and in rating methods such as diary-keeping and behavioral observation scales (Latham & Wexley, 1981). However, evidence presented by Borman (1977, 1979), Borman and Kenny (1976), and Warmke (1979) and summarized by Cooper (1981), suggests that halo error and accuracy are either unrelated or show a small positive relationship. In total, the evidence from this investigation and others indicates that suggestions for improving ratings must consider less consistent or more complex linkages in the rating process than earlier assumed. First, the relationship between frequency of observation and halo error is not necessarily negative. Next, since there is conflicting evidence regarding the relationship between halo error and accuracy, there is little reason to believe that simply increasing the number or length of ratee observations will lead to greater rating accuracy.

This study also focused on differences in various measures of halo error. Saal and colleagues (1980) concluded that the operational definition of halo error chosen may determine which rating format appears to be superior. The implication is that there was little convergent validity for the four measures of halo they tested. Our data suggest a different interpretation; while it is impossible to make absolute statements about halo error across the different measures, there can be consistency in their values over time. All four of the measures showed the same trend in our longitudinal study. In support of their arguments (Saal et al., 1980), our in-depth analysis of both mean levels and variability across matrices indicated a need to improve our conceptualization of halo error, as well as its operational definition, in order to detect changes in the structure of dimensional intercorrelations. This area clearly is in need of further examination.

While this study has shed light on many previously undiscussed or under-investigated aspects of halo error in performance ratings, certain limitations must be mentioned. Of primary importance is the potential lack of generalizability of the student-instructor relation studied to other work settings and relations. Our results need to be replicated where contact unfolds

more quickly and persists more intensely over time. Additionally, it would be advantageous to examine a greater number of ratees. In this study, 15 instructors were used as ratees; clearly this is a rather small set of ratees. Finally, our initial intercorrelations among dimensions were rather high and tended to increase over time. A relevant question for future research is what halo effects might be observed for jobs that show low intercorrelations among dimensions at an initial assessment.

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RESEARCH NOTES

ORGANIZATIONAL COMMITMENT: A COMPARISON OF AMERICAN, JAPANESE, AND KOREAN EMPLOYEES

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Considerable attention is currently being given to exploring differences between Japanese and American workers that might explain the widening gap between the productivity growth rates of the two countries. Some researchers have suggested that this difference in productivity growth is, at least in part, due to Japanese workers' having a higher level of commitment to their organizations than American workers (Cole, 1979; Hatvany & Pucik, 1981; Marsh & Mannari, 1977; Whitehall & Takezawa, 1968). Turnover rates are commonly cited to support the popular notion that Japanese employees, whose turnover rate is about half that of their American counterparts, are more committed to their organizations (Cole, 1979). The purpose of this paper is to compare levels of organizational commitment among American, Japanese, and Korean employees by means of a self-report measure of organizational commitment rather than by inference from other indicators of commitment.

DEFINITION AND BACKGROUND

Steers (1977) defines organizational commitment as the relative strength of an individual's identification with and involvement in a particular organization. Porter, Steers, Mowday, and Boulian (1974) suggest that it has three primary components: (1) a strong belief in and acceptance of the organization's goals and values; (2) a willingness to exert considerable effort on behalf of the organization; and (3) a strong desire to remain with the organization. In other words, an employee who is highly committed to an organization intends to stay with it and to work hard toward its goals. Many analysts—both academic researchers and the popular press—have suggested that this connection between organizational commitment and hard work is the reason why Japanese productivity has increased faster than U.S. productivity. That is, since Japanese workers are supposedly more committed to their organizations, they are therefore more productive than their U.S. counterparts.

A great deal of research in the United States has centered on determining the predictors of organizational commitment. Researchers have found that age is positively related to organizational commitment (Hrebiniak & Alutto, 1972; Koch & Steers, 1978; Morris & Sherman, 1981; Welsh & LeVan, 1981). Tenure has also been found to be positively related to organizational commitment (Koch & Steers, 1978; Stevens, Beyer, & Trice, 1978; Welsh & LeVan, 1981). These two variables, age and tenure, have been most frequently examined and have been most consistent in their relationship to organizational commitment.

Some researchers have examined the predictors of organizational commitment among Japanese workers. Starting with the hypothesis that Japanese workers are committed to a particular organization for life, Marsh and Mannari (1977) developed a measure of a distinctly Japanese version of organizational commitment, labelled "lifetime commitment," that they proposed would capture uniquely Japanese norms and values of loyalty to an organization. They found that job satisfaction, employee cohesiveness, perceived job autonomy, and organizational status explained 11 percent of the variance in lifetime commitment. Since these correlates, which leave much of the variance in commitment unexplained, cannot be considered to be uniquely Japanese, the authors concluded that commitment predictors are universal and not culture-specific.

Mobley and Hwang (1982) conducted a study similar to Marsh and Mannari's (1977) with a sample of Chinese workers. Once again they tested the notion that commitment has a unique set of predictors in a non-Western culture. They used the Organizational Commitment Questionnaire (OCQ) developed by Porter and his colleagues (1974). The strongest predictors of organizational commitment were age and sex; tenure was not significantly related to commitment. Overall, their results showed the generalizability of the predictors of organizational commitment and reinforced Marsh and Mannari's (1977) finding that commitment among workers in a non-Western culture is based more on universal than on culture-specific factors.

In sum, previous research that has examined the correlates of organizational commitment in non-Western countries has not, to date, directly addressed the contention that levels of organizational commitment in these countries are higher than in the United States. The purpose of this study is to compare overall levels of organizational commitment among samples of employees in three countries: the United States, Japan, and Korea. We included Korea — a country similar to, though in many ways different from Japan — in the study in order to obtain a comparison between two Asian countries. We examined the relationship between organizational commitment and two predictors, age and tenure, for the three countries, as well as the overall levels of organizational commitment.

METHODS

Subjects

A representative sample of employees was selected from widely diverse organizations in the United States, Japan, and Korea. Table 1 shows the

sample sizes for each of the types of firms represented in the Japanese and Korean samples. Although information on specific firm types was not available for the entire U.S. sample, it included employees from manufacturing, retail, service, and government organizations. In terms of size of the organization, 34 percent of the Japanese respondents and 59 percent of the Korean respondents were employed by firms with 1,000 or more employees.

Also, 93 percent of the U.S. respondents, 84 percent of the Japanese respondents, and 74 percent of the Korean respondents were nonsupervisory employees. The average ages of the respondents in each country were 41, United States; 31, Japan; and 29, Korea. In the U.S. sample, 59 percent of the employees had been with their organizations five years or less, whereas 58 percent of the Japanese respondents and 73 percent of the Korean respondents had been with their organizations five years or less.

TABLE 1
Sample Sizes by Type of Firm

Type of Firm	Japan	Korea
Electronics	55	44
Trading	11	45
Construction	7	46
Petroleum	19	40
Investments/finance	11	41
Banking	8	47
Government	6	39
Other	59	—

The subjects were asked to complete appropriate translations of the widely used 15-item version of the Organizational Commitment Questionnaire (OCQ) (Porter et al., 1974). To verify accuracy of translation the questionnaire was put into Japanese and Korean, and then translated back into English. Subjects' responses were scored on 5-point Likert scales in which "5" represented high commitment and "1" indicated low commitment, except for six negatively phrased questions. Subjects were also asked to report their ages and their length of tenure with their organizations. Completed questionnaires were obtained from 1,181 U.S. employees, 176 Japanese employees, and 302 Korean employees.

Analyses

Coefficient alpha (Cronbach, 1951), item analysis, and factor analysis (principal factors, varimax rotation) were used to estimate the internal consistency of the OCQ for each of the three samples. We computed the mean level of organizational commitment for each country, and used multiple regression analysis to determine if country, age, tenure, or a combination of these factors accounted for a significant amount of the variance in organizational commitment across the three samples. We also tested interactions among these three variables.

RESULTS

Reliability coefficients were relatively high for each of the three versions of the OCQ: .94 for the English and the Japanese, and .87 for the Korean.

The results of the factor analysis shown in Table 2 indicate that for the U.S. and Japanese samples the OCQ measured a single underlying construct. However, in the Korean sample, two factors emerged. Of six items on the OCQ associated with the second factor, five were negatively-phrased statements (numbers 3, 7, 11, 12, 15 on the questionnaire).

TABLE 2
Factor Analysis of the Organizational Commitment Questionnaire
in Samples from Three Countries

OCQ Item	United States Factor 1	Japan Factor 1	Korea ^b	
			Factor 1	Factor 2
1	.59	.76	.54	
2	.76	.78	.69	.31
3 ^a	.53	.75		.47
4	.45	.71	.61	
5	.65	.82	.55	
6	.78	.84	.70	.32
7 ^a	.50	.33		.34
8	.72	.77	.41	.52
9 ^a	.60	.74		.55
10	.75	.78	.47	.33
11 ^a	.65	.60		.70
12 ^a	.56	.61		.51
13	.68	.81	.44	
14	.76	.80	.52	.48
15 ^a	.69	.72		.67
Variance (%)	98.30	93.40	80.60	20.80
Eigenvalues	6.37	8.04	4.58	1.19

^aReverse-scored items

^bOnly factor loadings above .30 are reported.

The level of organizational commitment was significantly higher among the U.S. employees ($\bar{x} = 3.61$), while the levels of organizational commitment among the Japanese and Korean employees were similar ($\bar{x} = 3.21$ and 3.29 , respectively); $F_{2, 1572} = 62.301$, $p < .0001$.

Table 3 shows the results of the regression analysis using age and tenure as predictors of organizational commitment. Country accounted for 7.35 percent of the variance in organizational commitment; adding age and tenure to the model increased the explained variance to 11.8 percent, a significant increment. The correlation between age and tenure was .14. When country and tenure were held constant, the semipartial correlation (Cohen & Cohen, 1983: 88–90) between organizational commitment and age was .13. Holding country and age constant, the semipartial correlation between organizational

TABLE 3
Regression Analysis of Organizational Commitment
in Samples from Three Countries

Source	<i>df</i>	<i>R</i> ²	<i>p</i>	ΔR^2	<i>F</i>	<i>df</i>	<i>p</i>
Country	2,1570	.0735	.0001				
Age and tenure	4,1568	.1180	.0001	.0445	39.556	1,1568	<.01

commitment and tenure was .12. The interactions between country and age and tenure were not significant.

DISCUSSION AND CONCLUSIONS

The results of this study indicate that Japanese and Korean employees, who showed no difference in levels of organizational commitment are both less organizationally committed than U.S. employees. Since country by itself accounted for only 7 percent of the variance, the difference found between the United States and the two Asian countries may be of little practical significance, but the finding certainly refutes the widespread belief that Japanese workers are more committed to the organizations that employ them than are their U.S. counterparts. This finding is particularly surprising in view of the fact that a greater percentage of the Japanese and Korean subjects were supervisory employees who might, because of their higher level, be expected to be more committed to their organizations than nonsupervisory employees. Also, a significant percentage of the Japanese and Korean employees were from large companies where lifetime employment contracts are likely to exist. Therefore, it would seem to be premature to attribute the productivity gap between the United States and major competitors such as Japan solely to U.S. employees' lack of commitment to the organizations that employ them. The U.S. may actually be better off in this regard, at least according to the data derived from the most widely accepted way of measuring such commitment.

The results of our factor analysis need further interpretation. While the OCQ, as is appropriate, measures just one factor in the U.S. and Japanese samples, it measured two factors in the Korean sample. Close examination of the individual items associated with the second factor did not reveal a construct distinct from the first; the only obvious difference between the two factors was the phrasing of the items. Apparently, Korean respondents had more difficulty responding to the negatively-phrased items — which were reverse scored in the analysis — than to the positively-phrased items. Other studies using the OCQ have also found two factors (Mowday, Porter, & Steers, 1982), and at least one study found the second factor to be associated with reverse scored items (Angle & Perry, 1981).

Our regression analysis verified the positive relationships of organizational commitment with age and tenure, a finding consistent with a number of previous studies. In addition, and importantly, this study found that the

positive relationship holds across countries as well. In other words, our findings are consistent with Marsh and Mannari's (1977) and Mobley and Hwang's (1982) conclusions that organizational commitment is not based on culture-specific norms and values.

This study does not support the popular notion that the lifetime commitment concept in Japanese management practice is responsible for the lower turnover rate in Japan. The lifetime employment contract is typically limited to permanent white-collar and blue-collar employees in large firms (Ballon, 1969). Since the Japanese and Korean samples used in this study included a fairly large proportion of employees in large firms, the level of organizational commitment for Japan and Korea might have been expected to be higher than for the United States. Again, the results of this study do not support that prediction.

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PREDICTING ABSENTEEISM FROM PRIOR ABSENCE AND WORK ATTITUDES

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Absenteeism is a costly and disruptive withdrawal behavior that is difficult to control (Fitzgibbons & Moch, 1980; Mirvis & Lawler, 1977; Mirvis & Macy, 1976). One conservative estimate indicates that the total annual cost of absenteeism in the United States is between \$8.5 and \$26 billion (Steers & Rhodes, 1978). Given such a staggering cost, it is not surprising that researchers and practicing managers continue to search for clues to help them better understand and predict employee absenteeism.

A number of multivariate models specifying determinants of absenteeism can be found in the literature (Gibson, 1966; Mobley, Griffeth, Hand, & Meglino, 1979; Nicholson, Brown, & Chadwick-Jones, 1977; Steers & Rhodes, 1978; Watson, 1981). They vary in complexity, taking into account social, individual, and organizational factors that predict subsequent absenteeism. These factors include such variables as leadership style, control policies and procedures, role stress, attendance motivation, job expectations, and personal work ethic (Clegg, 1983; Johns & Nicholson, 1982; Muchinsky, 1977). None of the prior research or the models advanced have considered how prior absenteeism in one job is related to subsequent absenteeism on a new job in the same organization.

The present study examined this relationship. In those industries in which new technologies are being implemented to improve productivity,

placing some segment of the present employee group in newly engineered or structured jobs is likely to become a frequent strategy. Management will need insights into how employees are likely to behave in new jobs. Specifically, one important question is: Which employees presently employed by the organization are less likely to be absent in the future? Of course, management would prefer to select for new jobs those qualified and competent employees who are least likely to be absent.

In order to answer questions concerning the likelihood of absence, longitudinal research designs are required. Unfortunately, a high proportion of empirical research predicting absenteeism has focused on demographic variables and cross-sectional designs (Mobley, 1982). The causes and the predictability of absenteeism have been impossible to determine from these studies. Only a few studies have addressed this deficiency by utilizing longitudinal research designs (Breugh, 1981; Clegg, 1983; Keller, 1983). The present study used a longitudinal design to examine prior and subsequent absenteeism.

The majority of reported research has examined unskilled or semiskilled operatives or blue-collar workers (Steers & Rhodes, 1978); only a small number of studies have examined employees working in skilled or professional occupations (Breugh, 1981; Hrebiniak & Roteman, 1973; Keller, 1983; Newman, 1974). The present study examined skilled technicians who were retrained for jobs that involve modernized production and operations systems.

In addition to examining the relation between absenteeism rates on old and new jobs, the study examined the relationship between absenteeism on the new job and three work attitudes: organizational commitment, job satisfaction, and role overload. The specific hypothesis tested was: *past absenteeism is a better predictor of new job absenteeism in the same organization than are employee attitudes*. This hypothesis was suggested by the research of Waters and Roach (1979), who found a correlation of .62 between frequency of absences in two consecutive years, but a correlation of only $-.26$ between frequency of absences and job satisfaction in the previous year. Morgan and Herman (1976) also found a substantial correlation between frequency of absences in two consecutive years ($r = .70$). Further support for the hypothesis is found in a study by Breugh (1981), who studied 112 research scientists using a longitudinal research design and showed that past absenteeism was a better predictor of current absenteeism than were such work attitudes as job involvement, work satisfaction, and supervisory satisfaction. His study examined the prior-subsequent absenteeism linkage among individuals who were in the same job over the four-year period. The present research differs in that the association between prior and subsequent absenteeism is examined across different jobs (old and new) for the same individuals.

Since a few predictive studies on absenteeism are already available in the literature, the hypothesis is offered as an extension of previous research (Breugh, 1981; Clegg, 1983), and as a partial replication since no studies have examined old job–new job absenteeism in the same organization.

METHODS

Subjects

The subjects in this study were 121 technicians (104 males and 17 females) who worked for a medium-size electronics firm. The sample was 92 percent white with an average (1) age of 37.6 years, (2) organizational tenure of 9.3 years, and (3) job tenure of 4.9 years. The firm was nonunion. Individuals were selected from an employee roster using a stratified random sampling procedure. The roster listed the names of 524 technicians who were being transferred to new jobs because of the introduction of a new production and operations system including the introduction of new equipment and technology. This system change resulted in some workers being laid off, new employees being hired, and the transfer of 524 technicians to new jobs—most of which involved moving to a new job location in the two-building plant complex. Managerial decisions on layoff and retraining were said to be based on organizational seniority, job classification, job skills, and performance ratings.

Prior to the introduction of the new technology, 694 technicians were employed in the two-building facility. The changeover to the more modern plant occurred over a five-month period. New equipment, tools, control systems, and training for newly created jobs were part of the changeover. A total of 605 technicians were involved in formal training programs, which varied in length from 6 to 18 days. As part of the change, 89 technicians were laid off. Thus, 605 technicians left their old jobs on or about September 1980 and took over the newly implemented jobs. The organization agreed to permit a study that examined approximately 20 percent (131) of the technicians. However, complete data on absenteeism for the three-year study period (1981, 1980, and 1979) were available for only 121 of the selected technicians.

Measures

Organizational commitment was measured by mean scores on a 15-item scale designed to assess commitment or feelings of attachment to the goals and values of the organization (Porter, Steers, Mowday, & Boulian, 1974). Response formats were 7-point Likert-type scales ranging from strongly disagree to strongly agree. The internal consistencies reported by Porter et al. (1974) across four time periods ranged from $\alpha = .82$ to .93. In the present study, the 1981 administration of the scale yielded an alpha of .82.

Job satisfaction was measured by using the 20-item Minnesota Satisfaction Questionnaire (MSQ) short form. Each item has a 5-point rating scale ranging from very satisfied (5) to very dissatisfied (1). The MSQ is reported to measure intrinsic and extrinsic factors (Gillet & Schwab, 1975; Weiss, Dawis, England, & Lofquist, 1967). The coefficient alpha reliabilities for the 1981 administration were .76 for intrinsic and .80 for extrinsic factors.

Role overload is defined as an individual perception that a person has too many job activities to do in an allotted time period. Overloaded persons may be more prone to absence due to feeling below par or being ill, or may

stay away from work as a defensive behavior. Role overload was measured by a four-item scale using a 5-point scale ranging from strongly disagree to strongly agree. For the 1981 administration, $\alpha = .76$.

Employee absenteeism was measured in three ways: (1) Absence frequency was defined as the number of periods absent in 1981 ($\bar{x} = 3.1$; *s.d.* = 2.7), 1980 ($\bar{x} = 3.3$; *s.d.* = 3.0), and 1979 ($\bar{x} = 3.4$; *s.d.* = 2.9). A single absence period was that amount of consecutive unexcused voluntary absences due to a single cause. (2) Total days absent was defined as the total number of working (excluding holiday or vacation) days of unexcused absence for 1981 ($\bar{x} = 5.2$; *s.d.* = 4.9), 1980 ($\bar{x} = 5.0$; *s.d.* = 5.1), and 1979 ($\bar{x} = 5.3$; *s.d.* = 4.2). For example, an absence period of four consecutive working days was counted as one period of absence (frequency) and four total days absent. (3) Co-worker ratings included a 1981 and a 1980 rating given to each technician by two co-workers who had worked closely with the person during that year. These co-workers were selected by the technician's supervisor. The co-worker ratings used 7-point scales ranging from 1 = always seems to be absent to 7 = always present on the job.

As researchers warn, reliability of absenteeism measures is often a potential problem in research studies (Hammer & Landau, 1981; Ilgen, 1977; Muchinsky, 1977). In the present study the indices of absenteeism used had moderate reliability (as indicated by their stability over time, which amounts to test-retest reliability — see Table 1). Previous research indicates reliabilities ranging from .74 (Turner, 1960) to .35 (Farr, O'Leary, & Bartlett, 1971). There are also problems of contamination in absence data caused by the process of classification. The company used in this study recorded only two types of absence — excused (e.g., jury duty) and unexcused (e.g., stayed home because employee declared himself feeling below par). Only unexcused absence was used. Because of these possible problems with the data, the findings and conclusions reached in the present study should be treated as descriptive. They are an attempt to focus attention on one potential criterion management can use when making important human resource decisions concerning placements in new jobs.

Procedures

The measures of organizational commitment, job satisfaction, and role overload were included in a job survey booklet distributed to the technicians and completed during the last four months of each year. Respondents returned the sealed and confidential booklets, which had their names on them, to a research collection box located in the director of personnel's office. Co-worker ratings which allowed researchers to examine the degree of interaction among co-workers were also collected in sealed envelopes as part of the job attitude survey. The respondents and co-worker raters were personally briefed by the researcher in a large group and were informed that I was examining a number of individual and organizational characteristics that could be useful in understanding employee attitudes and behavior. Two large group meetings, one in

1979 and one in 1981, were used to keep an open communication channel between the researcher and respondents.

The company's unexcused absenteeism records were used to compute the frequency and total days absent.

RESULTS

In order to test the hypothesis, the researcher first looked at the intercorrelations among the three absenteeism measures, given in Table 1. All of the correlations were positive and statistically significant. Also, there were stronger associations between co-worker ratings and absence frequency than there were between absence frequency and total days absent. The stabilities of absence frequencies ranged from .66 ($r_{1981-1980}$) to .79 ($r_{1980-1979}$). However, the total days absent measure was less stable, ranging from .32 ($r_{1980-1979}$) to .27 ($r_{1981-1979}$). Also, the co-worker ratings ranged from .52 ($r_{1980-1979}$) to .64 ($r_{1981-1979}$). The average intercorrelations for the three absenteeism measures were .73 (frequency); .29 (days absent); and .58 (co-worker ratings).

Next, the correlations among the three 1980 work attitudes and the 1981 absenteeism measures were determined (Table 2). Four of the six intercorrelations among the work attitudes are statistically significant. The strongest absenteeism-work attitude associations are between absence frequency and intrinsic satisfaction, and absence frequency and role overload.

Hierarchical multiple regression analyses were used to determine whether any of the work attitudes increased the predictability of absenteeism beyond knowing the participants' previous absenteeism. Each predictor variable was

TABLE 1
Intercorrelations^a among Three Types of Absenteeism Measures

Variable	1	2	3	4	5	6	7	8	9
Frequency of absence									
1. 1981	—								
2. 1980	.66	—							
3. 1979	.72	.79	—						
Total days absent									
4. 1981	.60	.44	.48	—					
5. 1980	.43	.51	.47	.31	—				
6. 1979	.47	.54	.51	.27	.32	—			
Co-worker ratings ^b									
7. 1981	.70	.72	.73	.62	.70	.64	—		
8. 1980	.73	.68	.75	.63	.58	.52	.56	—	
9. 1979	.69	.64	.66	.60	.61	.58	.64	.52	—

^aDecimal points are omitted; all values are significant at $p < .01$; n's varied from 118–121 due to missing data.

^bCo-worker ratings were made on a 7-point scale (1 = always seems to be absent to 7 = always present on the job).

TABLE 2
Intercorrelations^a between 1980 Work Attitudes
and Three Measures of Absenteeism in 1981

Variable	1	2	3	4
1. Organizational commitment	(82) ^b			
2. Intrinsic satisfaction	35*	(76)		
3. Extrinsic satisfaction	29*	46*	(80)	
4. Role overload	-20*	14	11	(76)
1981 frequency of absence	-16	-26*	-07	31*
1981 total days absent	-05	-22*	-03	-01
1981 co-worker ratings	-12	-01	-13	25*

^aDecimal points have been omitted.

^bNumbers in parentheses = Cronbach α for 1981 administration of the work attitude measures;
 n = 116.

* $p < .05$.

assessed via two separate regression equations — one with the predictor and one without the predictor. No predetermined order was used to enter the various work attitude variables into the equation. For example, when analyzing the 1981 absenteeism measures, the corresponding 1980 absenteeism measure was entered first; various combinations of the work attitude variables were entered in subsequent regression analyses. Similarly, a set of regression equations were obtained in which various arrays of the work attitude variables were entered first, followed by the absenteeism measures.

The results of the order that added the most significant increments to the multiple regression analyses are reported in Table 3. When any of the work attitudes were entered after the absenteeism measures, little new variance was accounted for. But when the 1980 absenteeism measure was entered after the work attitudes, a significant amount of new variance was explained. The four work attitude variables were also combined into a composite measure and entered after previous absenteeism. In no equations did any of the composite variables add significant variance.

DISCUSSION

The present study first determined that the frequency of absence measure was a more stable measure of absenteeism across the 1979-1981 time period than was total days absent. The hypothesis that past absenteeism is a better predictor of subsequent absenteeism than work attitudes was supported by the results. Old-job absenteeism (1980), as measured by each of the absenteeism indices, was a better predictor of new-job (1981) absenteeism than any of the 1980 work attitudes (organizational commitment, intrinsic or extrinsic satisfaction, or role overload). As new jobs are created because of the introduction of new technologies, the selection of dependable employees will be an important issue. Who should be transferred to newly created jobs? What will be the potential cost of poor and good attendance if employees

TABLE 3
Selected Multiple Regression Results^a

Variables (in order entered into equation)	Dependent Variables									
	1981 Frequency of Absence			1981 Total Days Absent			1981 Co-worker Ratings			
	Cumulative R^2	Increment R^2	Fc	Cumulative R^2	Increment R^2	Fc	Cumulative R^2	Increment R^2	Fc	Fc
(a) 1980 absenteeism measure ^b	43	43	38.94*	10	10	8.97*	35	35	37.31*	
Organizational commitment	44	01	.91	12	02	1.01	36	01	.26	
Intrinsic satisfaction	44	00	.36	14	02	1.47	36	00	.05	
Extrinsic satisfaction	45	01	.42	14	00	.21	37	01	.19	
Role overload	46	01	.31	15	01	.24	38	01	.34	
(b) Organizational commitment	01	01	.68	05	05	7.38*	01	01	.13	
Intrinsic satisfaction	05	04	1.39	07	02	1.01	02	01	.43	
Extrinsic satisfaction	06	01	.43	08	01	.61	04	02	1.17	
Role overload	09	03	1.41	09	01	.32	06	02	.81	
1980 absenteeism measure ^b	46	37	31.31*	15	06	8.98*	38	32	36.31*	

^aWork attitudes (1980) were entered in all possible combinations, with results similar to those presented in this table.

^bThe 1980 absenteeism measure (for old job) that corresponded to the 1981 absenteeism measure (for new job) was used.

^cdf = 1,115 for all F tests.

* $p < .01$

likely to be absent or likely to attend are selected for newly created positions? These and similar questions need to be examined with longitudinal research designs.

The present study results are similar to what Breugh (1981) found in his study of research scientists. However, the results differ from what Keller (1983) found in his study of supervisory, professional, and clerical employees. He found that prior absenteeism, group cohesiveness, and internal health locus of control accounted for unique variance in subsequent absenteeism. Differences between Keller's sample (a mix of managerial and nonmanagerial, forty percent female, and only six percent college educated) and the technicians used in this study may account for the lack of comparability.

A number of limitations for generalizing the findings of this research should be noted here and weighed carefully because of the potential managerial implications and future research opportunities suggested by the present study. The study was conducted in one organization that purposefully worked at retaining a large number of present employees for newly created jobs. Whether most firms that reindustrialize will retain such a large number of present employees is not known. Also, whether a fifteen month period on a new job provides a true picture of employees' frequency of absence or total days absent is questionable. This study also involved a predominantly white male sample. Whether these findings generalize to predominantly female, all-female, or interracial samples should be examined.

Despite these limitations, the results of this study indicate that researchers should continue to consider frequency of absence in the past as a predictor of frequency of absence in the future. Previous research had determined this relationship for employees who worked in the same jobs over the duration of the study. The present study extended these findings to newly created jobs within the same organization. The clear relationship between past and future absenteeism seems important enough to examine with individuals other than technicians and across organizational boundaries. Studies that examine other occupations in the same firm, or that relate prior absenteeism in one firm to subsequent absenteeism in jobs involving new technologies (e.g., information systems) or new tasks in other firms seem warranted in light of current organizational attempts to introduce new technologies.

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AN INVESTIGATION OF THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND ABSENTEEISM: A MULTI-LEVEL APPROACH

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During the economic recession that ended in 1983, absenteeism was reported by the Bureau of National Affairs (BNA) (1983) to be at an historic low. Is this relatively low level of absenteeism an indirect result of poor economic conditions, or have managers simply become more adept at controlling it? In the field of absenteeism research (Steers & Rhodes, 1978), the absenteeism-unemployment relationship has been studied very little. However, Steers and Rhodes included unemployment in their theoretical model of attendance behavior. Although some researchers (Dansereau, Alutto, & Markham, 1978; Markham, Dansereau, & Alutto, 1983) found strong yearly and seasonal patterns in company-specific absenteeism data that they speculatively attributed to general economic conditions, they did not actually correlate absenteeism data with unemployment data. In fact, there appear to be no studies of the relationship between absenteeism and unemployment reported in the literature after the late 1950's.

Recently a model of absenteeism behavior, referred to as a push-pull model, has been suggested by Nicholson (1977). In this model, absenteeism is the behavioral result of a number of competing external and internal forces that move an employee to attend work. An assumption is made in this model that employees are aware of and responsive to those changes in the environment they perceive as affecting them. During periods of economic downturn, one of a worker's greatest fears is job loss. To prevent job loss, a worker makes extra efforts not to jeopardize employment. Furthermore, a downturn in the economy often requires management to reduce costs. As a result supervisors may be more aggressive in controlling absenteeism. Conversely, when unemployment is low and the economy booming, job opportunities are more available, and employees usually can obtain work elsewhere. At

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the same time managers are less concerned with an occasional absence because their attention is turned to meeting increasing customer demands.

There is little research on this particular topic. Behrend (1951) surveyed British coal mines and showed that the levels of unemployment and absences were inversely related. In a later study Behrend (1953) found that miscellaneous absences, measured on a six-month basis, decreased for men in 15 of 22 factories between 1951 and 1952 as unemployment rose. Crowther (1957), in a study using quarterly data from 1950 to 1955 of 18 factory populations, found similar trends in plotted data of absenteeism and local employment. However, no statistical tests were applied.

Unemployment figures and absenteeism rates are available from a wide variety of sources and have been aggregated in many ways: over time, across individuals, across plants, across industries, and across geographic regions. Each type of aggregation amounts to applying a different level of analysis. Rather than preclude any particular level of analysis *a priori*, this study assumes that the question of the appropriate level of analysis can be investigated empirically. Therefore, the following research question was addressed by this study:

Is unemployment significantly related to absenteeism at the national level, the regional level, and/or the organizational level?

METHODS AND MEASURES

National Level

National data on monthly absenteeism rates from 1976 to 1982 were collected from the Bureau of National Affairs (1976-1983). The data consist of median scores based upon random samples of about 350 companies. Because of changes in the survey methodology, BNA results prior to 1976 were not used. The methodology of the BNA survey has been discussed by Miner (1977). BNA defines job absence as unscheduled absence — not counting vacations, holidays, other scheduled leave, or absences of less than a full day. Because these data on absenteeism were not seasonally adjusted while the unemployment rates were, a control variable for season was included in the analysis. Season was defined as Winter (January through March), Spring (April through June), Summer (July through September), and Fall (October through December). This categorization was also used by Dansereau et al. (1978). The source for the unemployment data was the U.S. Bureau of Labor Statistics (BLS) (1976-1983); these data are seasonally adjusted and apply to all civilian workers.

An index of help-wanted ads was also included as another measure of unemployment that may affect absenteeism. Workers' anticipations of unemployment rates in future months may affect their decisions about the risks of being absent now. Thus, to correctly assess the unemployment-absence relationship, the perceived future risk of unemployment should be controlled. The help-wanted ads index used in the study was based on the volume of help-wanted advertising in major newspapers across the nation. A base rate

of 100 was established for 1967; the rate for April 1982 was 88 points. The source for these data was the monthly Survey of Current Business (U.S. Department of Commerce, 1976-1983).

The statistical techniques employed were regression and analysis of covariance, with inspection of the residuals. Durbin-Watson statistics were calculated to assess the extent of autocorrelation problems.

Regional Level

This analysis used the BNA absenteeism data that are reported for four geographic regions: Northwest, South, Central, and West. Unfortunately, the BLS does not publish unemployment data for equivalent regions. Therefore, regional unemployment rates had to be reconstructed from data for individual states. Four years of monthly state unemployment rates starting with January 1978 were coded into the data base. Each state's unemployment rate was weighted by the size of its work force in comparison to the other states in the region so that no state over- or under-contributed to the region's unemployment rate. Forty-five months of data on absenteeism were then regressed on the corresponding unemployment rates for each region. The index for help-wanted ads was not available at the regional level.

Organizational Level

The last part of the research addressed the organization level of analysis. A manufacturing plant in the garment industry in the mid-Atlantic region was contacted as part of a larger study. The majority of the 400 employees were female and worked under a piece-rate incentive system; the plant was not unionized. Monthly plant-level data were available to match the BNA data (1976-1982). There was no paid-absence program. Absence was defined as not being present when scheduled to work regardless of reason. Temporary lay-offs, holidays, and vacations were not counted in this figure. The daily total absenteeism rate was the number absent divided by the number of employees on that day's payroll. The monthly absence rate was a simple average of the daily rate.

The same variables and statistical techniques used in the national level study were used on the organizational-level data. Help-wanted ads and unemployment rates were regressed on the plant absenteeism rate while controlling for the effects of season. The organizational-level absenteeism data were also correlated with the national unemployment rate, the state unemployment rate, and the local SMSA unemployment rate. A priori, it is not evident how sensitive these workers are to unemployment rates at local, regional, or national levels.

RESULTS

National Level Results

The matrix of correlations and the means and standard deviations for all continuous variables are given in Table 1. The Pearson correlation between unemployment and absenteeism at the national level was $r = -.68$ ($p < .0001$).

TABLE 1
Results^a for National Unemployment and Absenteeism Rates

Variable	Intercorrelations			\bar{x}	s.d.
	1	2	3		
1. Absenteeism rate	—			2.67%	.41
2. Unemployment rate	-.68*	—		7.27%	1.28
3. Help-wanted ads	.45*	-.90*	—	122.08	25.84
	df	SS	F	p	R ²
Regression ^b	5	10.53	52.37	.0001	.77
Error	78	3.13			
Source:					
Season	3	3.24	26.84	.0001	
Help-wanted ads	1	2.49	61.99	.0001	
Unemployment rate	1	4.79	119.32	.0001	

^aN = 83 months

^bWith absenteeism dependent and season as the covariate

*p < .001

When the variables of season, help-wanted ads, and unemployment were all entered, the ANCOVA results yielded an R^2 of .77 ($p < .0001$, $df = 83$). The components of the model used with their corresponding degrees of freedom and sums of squares are shown at the bottom of Table 1. All three factors were significant at the .0001 level. The distribution of the residuals indicated no problems that might suggest need for a polynomial model. Furthermore, an investigation of the VIF (variance inflation factor) diagnostic statistic showed no problems with multicollinearity (Montgomery & Peck, 1982: 287). However, there was a significant autocorrelation problem with $r = .35$. Using the Cochran-Orcutt method of generalized least squares estimation for dealing with it (Ostrom, 1978), the adjusted R^2 term for the above equation is .65 ($p < .0001$), with no autocorrelation problem ($r = .06$) and an acceptable Durbin-Watson statistic of 1.87. After holding constant the control variables and the autocorrelation, the independent amount of variance accounted for in absenteeism by unemployment is $R^2 = .37$ ($p < .0001$).

Regional Level Results

The second part of the research question implies an issue of homogeneity: Is the relationship found at the national level homogeneous throughout the country? If the relationship is homogeneous, then it would appear that (1) the phenomenon would be generally distributed across the country so that any personnel manager or researcher could investigate it at a relatively lower level of analysis, and (2) there would be no need to look for any potential boundary conditions to explain heterogeneity in the findings.

In the Western region ($R^2 = .28$, $p < .0001$), Southern region ($R^2 = .49$, $p < .0001$), and the Central region ($R^2 = .15$, $p < .001$), there is a statistically significant relationship between unemployment and absenteeism after holding

seasonal effects constant. The relationship for the Northeast region is null ($R^2 = .03$, n.s.). The differences in absenteeism rates among the four regions were statistically significant ($p < .001$). While there are a number of alternative explanations for this lack of homogeneity between regions — e.g., an unspecified boundary condition, an inappropriate level of analysis, fewer data points than the national study (45 vs. 83), less precise regional unemployment estimates, etc. — the simplest explanation is that the unemployment rate in the Northeast region, which had a standard deviation of only half that of other regions, was too invariant. Or, in a more speculative vein, differences among the remaining regions might be attributed to different regional concentrations of right-to-work states and resulting differences in labor practices (Markham & Scott, 1985).

Organizational Level Results

The ANCOVA results with organizational absenteeism regressed on national unemployment and help-wanted variables (holding seasons constant) were significant ($F = 18.27$, $df = 5, 78$, $p < .0001$, $R^2 = .54$). Both season and help-wanted ads removed a significant portion of variation. The partial correlation of absenteeism and the national unemployment rate after holding constant the previously two entered variables was $r = -.56$ ($p < .0001$). There was no problem with autocorrelation for this relationship ($r = -.01$, Durbin-Watson = 2.02). Using the state-level measure of unemployment, the partial correlation with absenteeism was $r = -.35$ ($p < .002$). Using the local SMSA unemployment rate, the partial correlation with the organization's absenteeism rate was $r = -.20$ (not significant).

DISCUSSION

A significant relationship was found between absenteeism and unemployment at the national level, with the full model having an R^2 of .65, after adjustment for time-series autocorrelation. With the exception of the Northeast, partial correlations at the regional level produced significant relationships between absenteeism and unemployment when adjusted for seasonal effects. It is possible that with more extensive data or with the inclusion of an isomorphic measure of help-wanted ads, a level of association as high as that obtained at the national level might have been revealed. Alternatively, the results in the Northeast region might be a reflection of the fact that it has the fewest states with right-to-work laws and the highest concentration of unions. At the organizational level, results showed a significant relationship between absenteeism and unemployment after holding the control variables constant. The absenteeism rate for the organization studied was most closely associated with the national unemployment rate and was not significantly associated with the local rate.

It might be tempting to interpret these results from a psychological point of view. In other words, because the plant absenteeism rate is simply an aggregate over time of individual rates, it would be hard to imagine that an

unemployment-absenteeism "relationship" would not occur at the individual level of analysis. This classic ecological fallacy should not be made. Rather, corresponding research at the individual level of analysis should be conducted.

Other methodological caveats should be noted. First, the data used in this study were already aggregated at their respective levels of analysis by their collecting agencies. Although this practice makes intuitive and practical sense, it is not clear statistically that the within-unit variation contained in these aggregations should be considered error variance, which is what is implied by aggregation. Ideally, plant level data from each state for the six years in question could be assembled to test this level-of-analysis issue. Second, the relationships that were found might be even stronger had a "cleaner" criterion measure been used — one that distinguished between voluntary and involuntary absences in the same way for each plant in the BNA survey.

The important implications of these results for researchers are: (1) the perceived ease of finding alternative employment might be an overlooked, but important predictor of absenteeism, and (2) the perceived level of unemployment might act as a moderating variable for such relationships as that between absenteeism and satisfaction. For example, when unemployment is high, the relationship between absenteeism and satisfaction might disappear because absence levels are so depressed. Based on these results, it would appear that Steers & Rhodes (1978) were right in adding the unemployment variable to their model, even though there was little previous research concerning it and the level of analysis for its effects was unspecified.

Perhaps the most important research issues suggested by these results are at the individual level of analysis. Are workers' perceptions of unemployment associated with their absenteeism rates over time? Are workers' perceptions focused on the local community labor market, the national labor market, or the in-plant labor market when they assess the difficulty of finding alternative employment? Could the presence of unions act as a boundary condition by protecting workers from the effects of external labor market conditions?

There seems to be enough evidence to warrant proceeding with the research agenda described above. The examination of the effects of external environmental factors, such as unemployment, on the traditional dependent variable of absenteeism appears to hold promise for future studies.

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ATTITUDES TOWARD WOMEN EXECUTIVES: A LONGITUDINAL APPROACH

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Over the past two decades concern over discriminatory practices directed against women in organizations has increased (Heilman & Guzzo, 1978; Horner, 1970; Rosen & Jerdee, 1974; Terborg & Ilgen, 1975). Some attention has been given to roles women assume as managers and the ease or the difficulty with which they make progress in terms of salaries and promotions (Brief & Wallace, 1976; Chacko, 1982; Donnell & Hall, 1980; Garland & Price, 1977). Notwithstanding the enactment of federal and state legislation, changes in societal perspectives, and increasing numbers of job opportunities, women have had difficulty moving into highly responsible management positions (Stephens & DeNisi, 1980; Taylor & Ilgen, 1981).

Other studies have shown that male and female managers both have characteristics required for effective performance as managers, such as potential capability, cooperativeness and understanding, and competitive drive and leadership ability (Donnell & Hall, 1980; Lirtzman & Wahba, 1972; Stephens & DeNisi, 1980). Nevertheless, women have continued to experience difficulties making gains in salary and position in organizations. Some studies (Bass, Krusell, & Alexander, 1971; Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972) have indicated that even given a current awakening to the problem of sex stereotyping, negative attitudes still exist about women and the part they play in our society. These commonly held attitudes — that males are objective, independent, logical, and competitive, whereas women are gentle, sensitive, passive, illogical and emotional — may be blocking management career development for women. Stereotypical attitudes held by both males and females toward women managers have been shown to be quite detrimental to women executives' prospects for promotion and salary gains (Chacko, 1982; Donnell & Hall, 1980; Heilman & Guzzo, 1978).

The purpose of this research, a longitudinal study from 1975 to 1983, was to measure positive and negative attitudes toward women executives. Attitudes were examined over an eight year period to determine whether changes had occurred and whether specific trends spanning these years could be ascertained. Since a strong relationship exists between attitudes and behavior (Fishbein & Ajzen, 1975), studying attitudes towards women in management may help explain their lack of progress in terms of salary and position.

The author wishes to thank Ms. Virginia Homes for her help in the collection of the data.

METHODS

A scale (MATWES), designed to measure managerial attitudes toward women executives (Dubno, Costa, Cannon, Wanker, & Emin, 1979), was administered to MBA students at three graduate schools of business — two located in metropolitan New York City and one in Williamsburg, Virginia — at three different times over a period of eight years. In 1975, the MATWES was administered to 254 such management students; in 1978, to 152; and in 1983, to 259. Subject ages ranged from 24 to 45; the median age was 30. In 1975, the ratio of men to women in the sample was 140 to 114; in 1978, it was 85 to 67; and in 1983, 151 to 108. Over the measurement period, 665 individuals, 376 men and 289 women, responded to the scale. As the three schools, which offered almost identical courses, presented no discernible differences, and the gender ratios of each sample appeared to reflect the gender distributions reported by the institutions for that year, it could be assumed that the three samples had similar characteristics.

Reliability of the Scale

The MATWES (Dubno et al., 1979) was developed (1) to demonstrate scale development using a projective test for item generation, (2) to employ a panel of women managers as “experts” to select the items, and (3) to serve as a practical research tool for identifying organizational climates potentially hostile to the introduction of women into positions of executive responsibility. A panel of female administrators and managers Q-sorted 38 usable items from a pool of 259 items for the final scale (Kerlinger, 1973). The internal consistency of the items was computed by correlating item scores with total scores, which consisted of the sums of item scores. The 38 items correlated with the total scores at levels significant at less than the .05 level of probability. These items were then arranged in a 5-point Likert scale in which the description of each point ranged from “highly agree” to “highly disagree.” Internal consistency correlations ranged from .24 to .73; $\alpha = .97$. For test-retest reliability the scale was readministered after a four week interval with as many of the same subjects as were available. The coefficient of reliability was .78 ($N = 65$).

Validity

When concurrent validity for the MATWES was sought by administering the scale simultaneously with WAMS (Peters, Terborg, & Taylor, 1974), a scale developed to measure general attitudes toward women as managers, to a new sample of 258 subjects, the correlation obtained between the two scales was .73. In addition, the median scores of male and female respondents ($N = 258$) were compared and the difference was found to be significant by χ^2 at the .001 level; the median score for females was 120; for males, it was 65. Of the female respondents, 93 percent scored below the median as opposed to only 32 percent of the males. These results appeared to support MATWES' value as a usable measure of prejudice.

RESULTS

Table 1 shows *N*'s, means, standard deviations and medians for each year that data were collected for the longitudinal study with MATWES. A one-way ANOVA found no significant differences across means for men: $F_{2,373} = 1.61$; or for women: $F_{2,286} = 138$. This indicates that no significant trends in either a positive or a negative direction occurred over the years. The items of the MATWES are keyed so that high scores — above the median — indicate negative attitudes and low scores — below the median — indicate positive attitudes toward women as managers. Table 1 shows how male attitudes differed from female attitudes and how each gender remained consistent in its attitude for all three years of analysis.

The results show that, between 1975 and 1983, male MBA students retained consistently negative attitudes toward women as managers, while their female counterparts were consistently positive. Furthermore, the men were significantly more negative than the women were positive. To illustrate the differences in attitude between male and female managers, a median split of the MATWES scores for each of the years studied was obtained and the percentages of males and females above and below these medians was calculated, as Table 2 shows.

TABLE 1
Mean MATWES Scores and Sample Distributions by Gender and Year^a

	1975*			1978*			1983*			Totals
	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	
Men	140	86.9	19.2	85	88.1	19.7	151	85.8	19.3	
Women	114	70.8	12.1	67	70.1	12.1	108	71.5	12.2	289
Totals	254	79.4	18.4	152	81.1	18.2	259	80.0	18.1	665

^aRange of scores for MATWES was 38-190. Medians for the three years were 79, 78, and 77, respectively. Differences between means across years for both men and women were not significant by *F*-test.

*A *t*-test between men's and women's mean scores within each year was significant, $p = < .001$.

TABLE 2
Percent of MBA Students Above and Below Median Scores on MATWES by Gender and by Year

	1975 ^a		1978 ^b		1983 ^c	
	Men	Women	Men	Women	Men	Women
Above median (negatives)	68	7	76	17	65	21
Below median (positives)	32	93	24	83	34	79

^aMedian score 79; $\chi^2 = 76.2$.

^bMedian score 78; $\chi^2 = 68.2$.

^cMedian score 77; $\chi^2 = 71.7$.

* $p < .001$.

Analyses of the data by χ^2 shows that, for each year of study, significant differences between males' and females' attitudes toward women managers occurred. Analyses of the differences between mean attitude scores for male and female MBA students by *t*-tests yielded significant differences ($p < .001$) for 1975, 1978, and 1983.

DISCUSSION

This study has presented a longitudinal analysis of the attitudes of MBA students toward women executives in organizations. The finding that the male MBA students studied held more negative attitudes toward women executives than did the female MBA students is in itself not surprising. However, the fact that during the eight years studied, no discernible trends were uncovered that revealed either an increase in negative or positive attitudes toward women managers is interesting. Of further interest, during this period, 1975 to 1983, feminist movements and the drive for passage of the Equal Rights Amendment were at intense levels, yet neither male nor female MBA students changed their attitudes toward women as executives in organizations. As a matter of fact, a slight, but statistically nonsignificant, negative trend can be noted for female respondents, but, as it is not statistically significant, further speculation as to its origins is inappropriate at this time.

The strong differences in attitudes between male and female MBA students suggests that, despite the feminist movement, males still hold significantly more negative attitudes toward women managers than females. Attitude theory and research (Fishbein & Ajzen, 1975) suggests that male managers with negative attitudes are predisposed to act on these attitudes when dealing with women in organizations. Such actions may be particularly detrimental to women managers with respect to advances in salary and position. Support for legislation that, in effect, introduces forced compliance (Brehm & Cohen, 1962) and mandates equitable and unprejudiced treatment of women could therefore have a profound effect on male attitudes and behavior toward female managers, which could result in equitable advancement in salary and position for women managers in the future.

CONCLUSIONS

This longitudinal study of male and female MBA students' attitudes toward women executives has shown that a wide discrepancy exists between these two groups. Men are much more negative toward women executives than are women. Furthermore, over an eight year period, the data collected showed no discernible trends in either a positive or a negative direction. Apparently, men and women are polarized in their attitudes regarding women executives, and tended to remain so during the past decade. Because a large proportion of the MBA sample members are expected to enter business organizations as managers, women executives may expect to continue to suffer from discrimination and stereotyping for some time to come.

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Peter Dubno earned his Ph.D. in psychology in 1960 at New York University. He is currently Professor of Behavioral Science and Coordinator of Organizational Behavior at New York University's Graduate School of Business Administration. His current research interests are in career development problems of women who hold managerial or executive positions in organizations.

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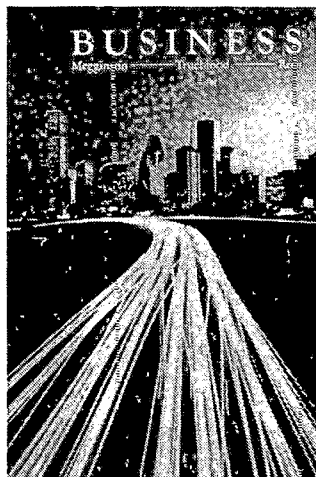
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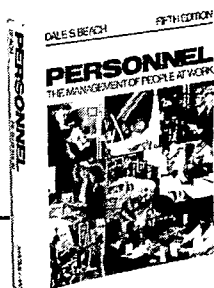
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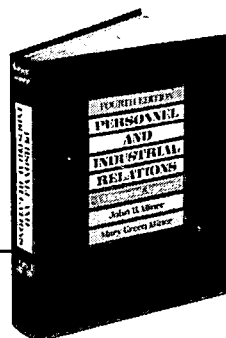
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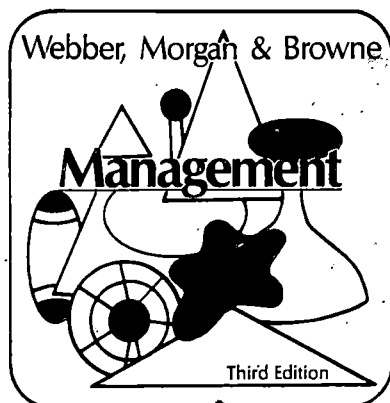
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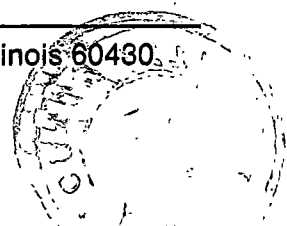
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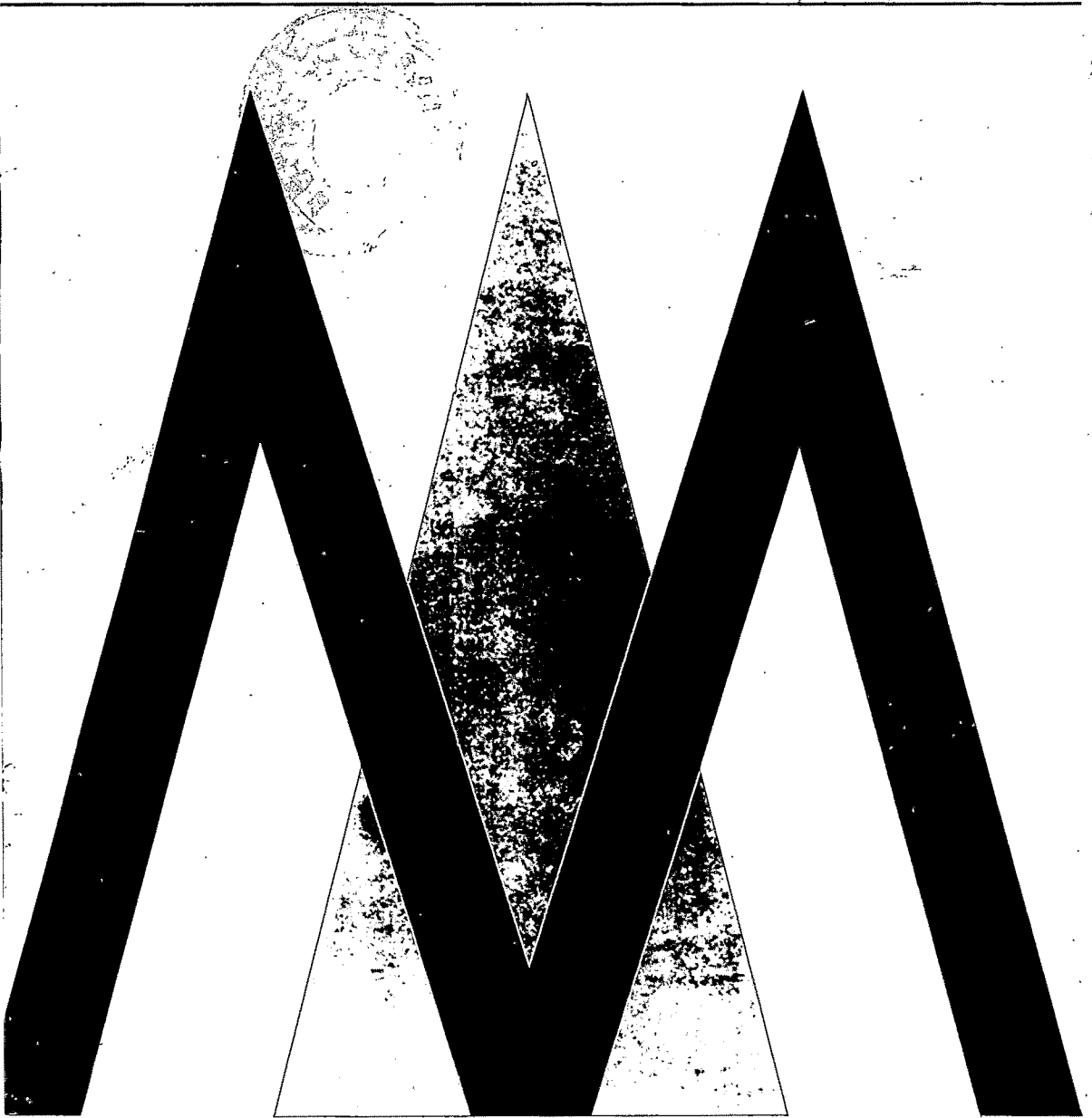
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MANAGERIAL COMPENSATION BASED ON ORGANIZATIONAL PERFORMANCE: A TIME SERIES ANALYSIS OF THE EFFECTS OF MERIT PAY

JONE L. PEARCE
WILLIAM B. STEVENSON
JAMES L. PERRY
University of California, Irvine

Performance-contingent compensation is a widely accepted means for rewarding managers, but there are no rigorous empirical tests of its effectiveness. This study reports the results of a longitudinal analysis of the effects of tying managerial pay to organizational performance in the Social Security Administration. A Box-Jenkins time series procedure was applied to organizational performance data available two years before and two years after the implementation of a new compensation system. Statistical analyses indicated that the merit pay program had no effect on organizational performance, suggesting that merit pay may be an inappropriate method of improving organizational performance.

Does tying managerial compensation to organizational performance lead to higher organizational performance? It appears to be a truism that if you want to motivate high performance, you attach rewards to it. Several prominent scholars of organization behavior (Fein, 1976; Lawler, 1971, 1981) support this common sense view. However, although merit pay and bonuses for managers are common forms of compensation, there have been no rigorous tests of their effectiveness (Dyer & Schwab, 1982).

The present study reports the results of a test of the effects of a merit pay compensation system for managers. A Box and Jenkins (1976) time series procedure was used to determine whether or not implementing a merit pay plan that tied managers' salaries to four organizational performance indicators resulted in improved organizational performance. A quasi-experimental design, incorporating a before-and-after time series (Cook & Campbell, 1979), allowed us to consider, over a period of more than four years, the effects of implementing merit pay as an intervention into the trajectories of the four performance indicators. This procedure provided, after removing historical trends or periodic oscillations in organizational performance from the data, a rigorous test of the expected effects of merit pay on overall organizational performance.

An earlier version of this paper was presented to the Personnel and Human Resources Division at the 1983 national meeting of the Academy of Management, Dallas, Texas.

THE EFFICACY OF PERFORMANCE-CONTINGENT PAY

The Connection between Pay and Performance

Many theorists have discussed the motivational aspects of pay. Opsahl and Dunnette (1966) reviewed several prominent psychological theories and discussed their implications for organizational compensation, but did not, however, discuss performance-contingent pay. Gellerman (1963) emphasized the symbolic role of money, but had little to say about how compensation should be administered to increase performance. Herzberg, Mausner, and Snyderman (1959) made the provocative argument that pay is a "hygiene factor," not a motivator of performance. However, King's (1970) comprehensive review of research found no support for Herzberg et al.'s two-factor theory. Proponents of equity theory (Adams, 1965) proposed that individuals who perceive themselves to be underpaid or overpaid may alter their efforts to achieve a balance between performance and reward. Again, subsequent research failed to support the performance predictions of equity theory (Dyer & Schwab, 1982; Goodman & Friedman, 1971).

A different perspective was offered by Deci (1975), who conducted a series of studies on the effects of externally-mediated rewards, such as pay, on laboratory subjects' intrinsic motivation to engage in tasks. Deci drew on this research to argue that contingent payment plans should be avoided because they reduce intrinsic motivation, lead individuals to develop strategies that will enable them to get rewards with the least effort, and can easily break down, if for instance, "no one is looking." These arguments are particularly relevant to managerial jobs, since such jobs are more likely than routine jobs to be intrinsically rewarding and are less likely to be subject to extensive surveillance. Deci suggested that salaries not directly based on performance are less likely to reduce intrinsic motivation than are salaries that are performance-contingent. Unfortunately, it is not clear from his argument whether this substitution in task motivations will necessarily result in either increased or decreased task performance. Furthermore, none of the theories that have been mentioned here, or any other discussions of pay for managers (Dunnette, Lawler, Weick, & Opsahl, 1967) directly address the question of what conditions are required to produce a successful contingent pay system in organizations.

The most recent advocates of merit pay in organizational settings include Lawler (1971, 1981, 1983) and Ellig (1982). Basing his argument on Vroom's (1964) expectancy theory, Lawler argued that pay can be a powerful performance incentive because it can be used to satisfy so many needs (1971: 26). However attractive money may be, Lawler contended (1971, 1981), it cannot motivate performance unless it is contingent on performance; he presented research from numerous studies that showed that managerial pay is seldom contingent on performance. Further support for the lack of connection between pay and performance was provided by Haire, Ghiselli, and Gordon (1967), who reported that managerial raises are often uncorrelated from one year to the next, indicating that either managerial performance is quite dif-

ferent from one year to the next — or, what is more likely — that raises are not based on performance but on other, possibly variable, criteria.

It is important to note that, although most scholars advocate performance-contingent pay systems, they recognize that under certain conditions the implementation of such systems may be more dysfunctional than functional. According to Lawler (1971, 1981), performance-contingent pay should not be used when trust levels are low, performance cannot be validly and inclusively measured, and large pay rewards cannot be given to the best performers. Lawler (1971) also acknowledged that managers may not control all of the factors that affect their unit's performance, concluding that under such circumstances subjective judgments by superiors and objective unit performance data should be combined into a managerial performance measure on which pay could be based.

Empirical Research on Contingent Pay

Although there have been empirical studies of the effects of performance-contingent pay for nonmanagement employees that supported such plans (Dyer & Schwab, 1982; Fein, 1976), and others reported dysfunctions of such pay plans (Babchuk & Goode, 1951; Whyte, 1955), there have been no direct tests of the effects of performance-contingent pay for managers. The only available information comes from surveys of the relationship between level of executive pay and performance.

Fein (1976), reporting a consulting firm's 1971 survey, writes that firms with formal bonus plans (which, we infer, were based on a measure of firm performance) had an average pre-tax return on investment of 15.8 percent, compared to 11.7 percent for firms without a formal plan; the after-tax profits were 8.6 percent versus 5 percent. Unfortunately, we cannot tell anything about the sample or whether these differences were statistically significant.

In Redling's (1981) study, performance was measured by a 5-year performance ranking that combined earnings growth and return on shareholders' equity. Using a randomly selected sample of 25 companies, he correlated each organization's ranked performance with its base salary growth and with its salary-plus-bonus growth over 5 years. He found a correlation of .16 between base salary increase and firm performance and a correlation of .09 between salary-plus-bonus increase and performance, from which he concluded that there was little indication of the existence of performance-contingent pay plans in current top executive compensation.

A final account of the extent to which compensation for executives is, in fact, contingent on firm performance is offered in a magazine article by Loomis (1982). The author, who plotted 1981 compensation (salaries, bonuses, profit sharing, stock purchase contribution) against return on stockholders' equity, found a less than perfect correspondence, and moreover, highlighted extreme cases of executives receiving relatively large increases in compensation during a period of deteriorating profitability for their firms. Loomis argued that executive compensation in these prominent publicly-held firms should be more directly tied to firm performance.

The assumption that performance-contingent pay should result in enhanced organizational performance is widespread. Redling's (1981) and Loomis's (1982) advocacy of managerial pay based on organizational performance measures echoes the recommendations of compensation specialists (cf., Ellig, 1982). Yet, as this review of theory and research tying managerial compensation to organizational performance shows, there is a lack of conclusive empirical support for this assumption due to an absence of systematic research. Dyer and Schwab (1982) noted that there is research evidence that incentive pay plans for nonmanagement employees produce higher productivity, but that there have been no field studies of managerial merit pay plans. Nevertheless, some argue that managerial performance should be higher using such programs, and even if these programs are not perfect, the alternative of noncontingent pay certainly does not motivate performance (Ellig, 1982). The present study is the first systematic attempt to assess the actual effects on organizational performance of the introduction of performance-contingent pay for managers.

METHODS

This study was conducted as part of a larger study of personnel reform in five federal government agencies (Perry & Porter, 1981). Extensive interviews, on-site observations, surveys, and record audits from this larger study supplemented the archival data reported in the present study. The Social Security Administration (SSA) was the site of this study. The performance-contingent pay system was implemented in the SSA as part of the Civil Service Reform Act of 1978, and, as in all federal agencies, covered managers, but not their subordinates. This new pay system allocated one-half of annual pay increases for managers automatically and the other half on the basis of rated performance; in the prior system, the entire increase was routinely awarded. The new discretionary or merit portion of the annual increase was allocated to managers from a pool of funds according to the distribution of their performance ratings within the pool. The overall size of the annual pay adjustment was determined by a presidential decision based, in part, on a salary survey of comparable jobs in the private sector. In the initial year of implementation, 4.5 percent of the amount of base salaries was available for merit increases, and in the second year, 2.4 percent.

Sample

Performance data were collected from a regional network of 20 local district and branch SSA offices, ranging in size from 12 to 73 employees. The primary functions of each office were to accept claims, determine eligibility for benefits, and maintain records for retirement, insurance, and income supplement programs under Titles II and XVI of the Social Security Act. Managers in these 20 offices were part of the same merit pay pool. We combined performance indicators for the 20 district and branch offices into aggregate time series, because our research hypotheses focused on whether

the merit pay plan had effects on Social Security offices in general, rather than on whether a particular manager or group of employees responded favorably to it.

Measures

Monthly time series for four performance measures were the basis for the present study, with the number of observations in each series ranging from 48 to 53. Although several additional performance indicators were used during one yearly appraisal or the next, we confined our analysis to the following indicators that were used continuously over the study interval: (1) the average number of days for a retirement/survivor's claim to be paid or denied (performance measure 1), measured for 53 months from October 1977 to February 1982; (2) the average number of days for an aged supplemental income claim to be paid or denied (performance measure 2), measured for 53 months from October 1977 to February 1982; (3) the percentage of supplemental income claims with accurate payment documentation (performance measure 3), measured for 49 months from February 1978 to February 1982; and (4), the percentage of post-entitlement actions that took over 30 days to be settled (performance measure 4), measured for 48 months from October, 1977 to September, 1981.

A district office's performance on objective measures accounted for the largest share (40%) of its manager's rating for determining merit pay. The four indicators were designated "critical elements" in the first performance period by the regional commissioner of SSA, which meant that performance below standard on any of them resulted in automatic denial of a merit pay increase. The remainder of the performance rating was composed of supervisory evaluations and objective measures that were not critical and changed each year (e.g., affirmative action progress or meeting office security goals).

Subjective and objective ratings were converted to scores ranging from a 0 for unsatisfactory performance to a 4 for outstanding performance. For example, in fiscal year 1981, the standards for performance measure 1 — the average number of days for a retirement or survivor's claim to be paid or denied — for the Southwest California Area were: level 0, 34 or more days; level 1, 33 days; level 2, 30–32 days; level 3, 29 days; level 4, 28 or fewer days. All of these subjective and objective ordinal scores were then weighted and averaged to produce the overall rating on which the merit pay award was based.

The objective organizational performance measures used in this study were available for 2 years prior to creation of the merit pay system. Because they had become accepted measures of SSA performance, much as profitability is for business firms, they were not changed in any significant way to accommodate merit pay. Managers who were responsible for overseeing them indicated there was a high positive association between objective and final merit ratings. Field observations and extensive interviews also revealed that managers were highly attentive to the objective measures because of concern for their effects on final merit ratings and awareness that failure to perform

satisfactorily on any of them would result in automatic denial of a merit pay increase (Perry & Porter, 1981).

Interventions

The effects of changing to a performance-contingent compensation system were assessed in terms of the hypothesized statistical effects of three interventions into each of the four time series. The first intervention corresponded to the initiation of merit pay orientation and training sessions in September, 1979. We hypothesized that the training intervention would familiarize managers with the new contingent pay program and might sensitize them to attendant expectations, thereby spurring an increase in performance. The second intervention corresponded with the actual start of merit pay on January 1, 1980, the date on which future annual increases became contingent on organizational performance. The third intervention corresponded with the end of the fiscal year on October 1, 1980, when annual merit pay adjustments began to be distributed in monthly paychecks and the second year of merit pay started.

Statistical Methods

The measurements of the four indicators of organizational performance at regular intervals form four time series of observations. We constructed a statistical model describing each time series, and then added the dates of the three interventions to the model. If an intervention produced a significant effect on the time series — that is, a change in level or slope not predictable from the model describing the series — we could conclude that merit pay had an effect on organizational performance.

An important first step in testing the effects of the merit pay interventions was constructing a statistical model of each time series. The reasons why ARIMA modeling was preferred to the alternatives are discussed in the Appendix.

Because of its ability to model the systematic components in the time series, we chose ARIMA modeling for this analysis; however, ARIMA modeling has certain drawbacks. The technique requires lengthy time series; most analysts recommend time series of at least 50 observations in order to identify the parameters of the model. In the present study, the four time series included from 48 to 53 observations. ARIMA modeling could also be criticized because the removal of trend and the estimation of autoregressive and moving average parameters are atheoretical and represent the removal of the effects of unmeasured variables. On the other hand, this technique is no more atheoretical than adjustments for autocorrelated errors made in econometric models, and with lengthy time series, may provide a more accurate model for estimating the effects of interventions (Albritton, 1981; Hibbs, 1977).

Interventions are added to the ARIMA model by specifying a transfer function that translates the effect of an intervention into an expected effect on the series. The effect hypothesized by the analyst may take a variety of

forms (Box & Tiao, 1975; Hibbs, 1977). For example, an intervention like a new law reducing the hydrocarbons in gasoline may be expected to have a sudden, abrupt effect on air pollution in the Los Angeles basin (Box & Tiao, 1975); another intervention, such as a new law requiring seat belts in new automobiles, may be expected to produce a gradual, constant change in the automobile death rate as new automobiles are purchased (Bhattacharyya & Layton, 1979). In the present case, assuming that managers cannot cause instantaneous changes in organizational performance, we hypothesized that the implementation of merit pay would produce a gradual and permanent change in organizational performance over a period of months, a process that can be represented as a transfer function (McCleary & Hay, 1980):

$$Y_t = \frac{U_0}{1 - S_1 B} I_t + N_t$$

where

Y_t = the original time series,

U_0 = a parameter representing the initial impact of the change,

S_1 = a parameter representing the rate of change after the impact,

B = the backshift operator — when applied to a variable, the variable is shifted backward one time point (Box & Jenkins, 1976),

I_t = the impact variable, equal to 0 before intervention, to 1 afterward,

N_t = the ARIMA noise model,

and where $-1 < S_1 < 1$.

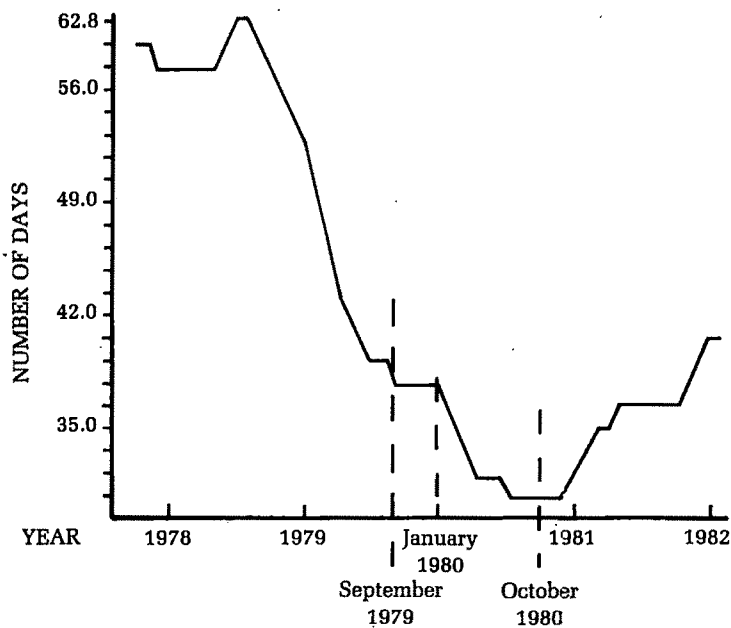
The rate of change variable S_1 is constrained to be less than ± 1 to insure a stable impact. If both the U_0 and S_1 parameters were statistically significant, the implementation of merit pay for managers would have had a significant gradual, constant impact on organizational performance. If the U_0 parameter alone were significant, the implication would be that the initial impact was instantaneous, and therefore, the rate of change parameter (S_1) was unnecessary. In this case, the transfer function may have been misspecified and a transfer function reflecting an instantaneous change in the series may have been more appropriate. If the U_0 parameter were not significant, then the implementation of merit pay had no initial effect, and the S_1 parameter was irrelevant.

RESULTS

Figure 1 presents plots of the four performance measures over time. We smoothed the data, reducing variation around the general trend by calculating running medians of 4, then 2, then 3, and then calculating a running average, and then reapplying the entire process, in order to clarify the pattern of the data. This process, implemented by the MINITAB interactive

FIGURE 1
Smoothed Time-Series for Four Performance Measures

(a) Days for a Retirement/Survivor's Claim to Be Paid or Denied (Measure 1)



(b) Days for an Aged Supplemental Income Claim to Be Paid or Denied (Measure 2)

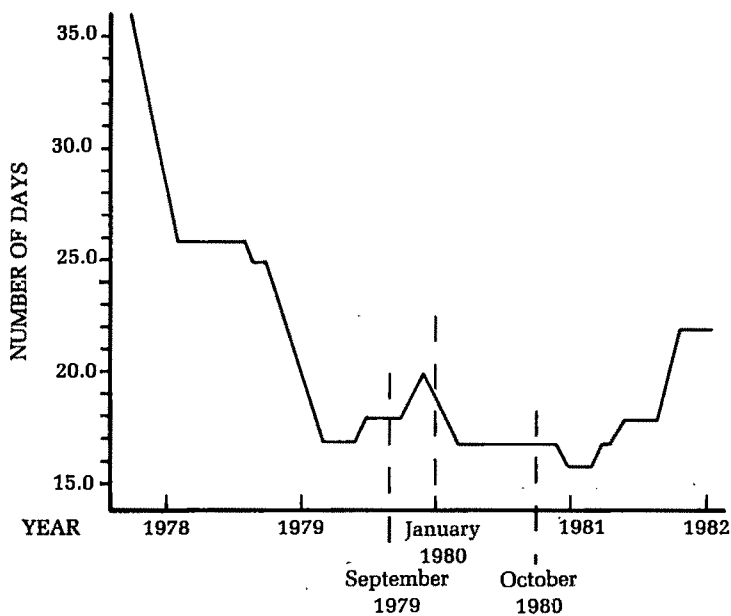
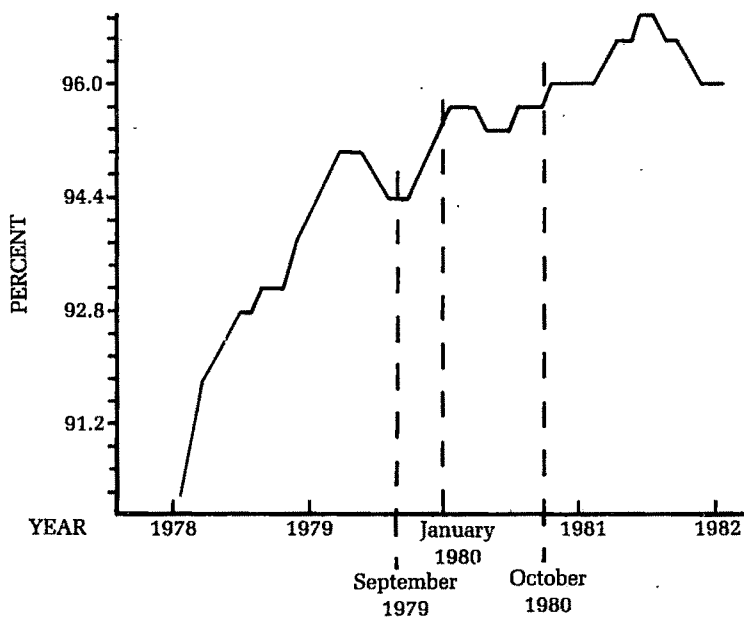
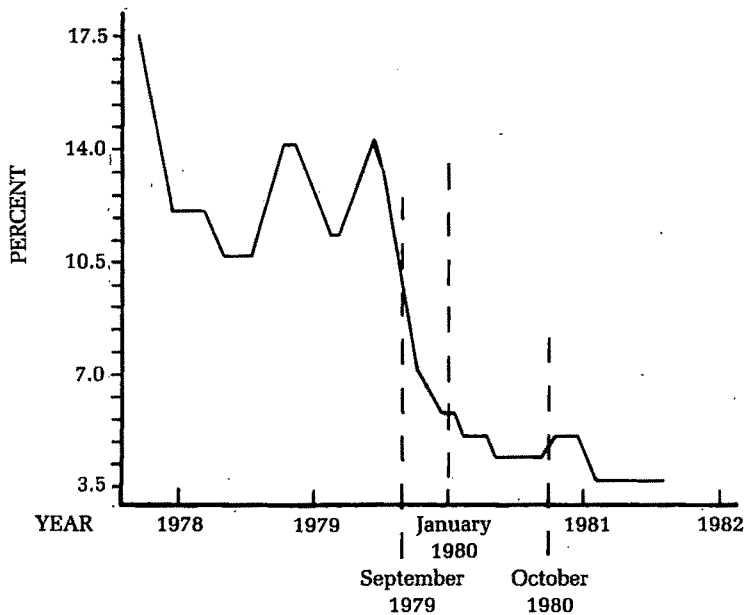


FIGURE 1 (continued)

(c) Percentage of Supplemental Income Claims with Accurate Documentation (Measure 3)



(d) Percentage of Post-Entitlement Actions That Took Over 30 Days (Measure 4)



computer program (Ryan, Joiner, & Ryan, 1981), provides a smoothing procedure resistant to extreme values but retaining the overall pattern of data (Velleman & Hoaglin, 1981).¹

As can be seen in the figures, performance was improving before the implementation of merit pay. Our data do not extend far enough back in time to detect the origin of the trend, but it is clear that there is a general upward trend in performance over the study period, with no obvious changes in direction due to the implementation of merit pay.

We supplemented these descriptive results with formal hypothesis testing using ARIMA analysis (McCleary & Hay, 1980); Table 1 presents the results. Before the analysis, we removed trends in the data, evident in the figures, by differencing. Then, we formulated a model describing the time series in terms of any month-to-month repetition and thus autoregressively correlated data points or repetitive moving average random shocks. Any systematic component in the data based on more than month-to-month repetition could have been removed by adding seasonal components to the model, but this was unnecessary. Because several of these time series exhibit floor or ceiling effects — that is, the series asymptotically approach an upper bound of performance that may be impossible to surpass, for instance 100 percent accuracy — and because several series approach this boundary nonlinearly, all of the time series except that for supplemental security income claims were transformed to their natural logarithms (McCleary & Musheno, 1981).

The appropriate models are displayed in Table 1 in Box and Jenkins (1976) “*p d q*” notation where *p* indicates the order of the autoregressive parameter, *d* indicates the degree of differencing, and *q* denotes the order of the moving average parameter. First, we estimated all models with a trend constant to account for any additional trend after first differencing. If the trend constant was not statistically significant it was deleted, and the equation was reestimated. The coefficients in the initial models were statistically significant (twice their standard errors) except for the coefficients of performance measures 2 and 4, for which transforming the data to logarithms and taking a first difference to remove trends were adequate to model the data.

Once the ARIMA models were specified, analysis proceeded to testing the effects on the time series of events treated as interventions by adding a transfer function to the model. If the parameters of the transfer function are significant, the intervention had had a significant effect on the time series above and beyond any trends in the data and autoregressive and moving average regularities. As can be seen in Table 1, the gradual, constant intervention hypothesis was not supported. The parameters of the transfer function added to the ARIMA model were not significantly different from zero for any of the performance measures, except for the September 1979 training effect for the first differenced logarithm of performance measure 4. This one

¹However readers are cautioned that smoothing data does remove some of the important detail; we relied upon statistical analysis of the raw data in the testing of our hypothesized intervention effects.

significant result could be taken as evidence of some slight positive effect of merit pay, but in order for this result to be considered substantive support for the effects of merit pay plans on performance, we would have to assume that managers began to manage in a way that brought about an increase, beginning during the training period, in the speed of processing one particular type of claim, even though managers did not know during the training period exactly which indicators from among those available would be used to evaluate their performance. Substantively, however, it seems more likely that a positive effect of merit pay would be manifested in more than one performance indicator. Indeed, if these tests are not considered to be independent of each other and the probability level for statistical significance is appropriately altered, the statistically significant effect for performance measure 4 vanishes. Overall, then, positive effects of the implementation of merit pay, whether conceived of as caused by a training effect on September 1979, a simple implementation effect on January 1980, or a delayed effect on October 1980, were not supported by the data.

DISCUSSION

Our analysis of the effects of the implementation of a performance-contingent pay program for managers indicated that its implementation had no statistically significant, gradual, permanent effect on the general trend of organizational performance in 11 out of 12 tests. These statistical results confirm the pattern seen in an examination of plots of 4 measures of organizational performance from October 1977 to February 1982. For whatever reason, organizational performance was improving in the Social Security Administration offices well before the passage of the Reform Act, and neither the implementation of merit pay as a system, nor the first year of rewarding managers with merit pay had any additional effects.

There are limitations to this study that prevent drawing definitive conclusions about the effect of merit pay on organizational performance. First, of necessity, the majority of our statistical tests focus on the implementation of merit pay. The program was clearly designed to improve organizational performance, and 8 of our 12 tests assess the effect of training and the start of the program on organizational performance, an emphasis somewhat different from testing changes in organizational performance after merit pay rewards were distributed. Thus, although we did examine four performance measures at one point after rewards began to be distributed, we were more oriented to the question of whether implementation of the program had effects, rather than to possible effects of rewards over a longer period of time. This merit pay program has continued in operation, and further testing may reveal long term positive or negative effects on organizational performance.

Second, there is evidence that the implementation of this federal merit pay program was flawed in several ways. The program was implemented amid court challenges and disputes among responsible agencies, such as the Office of Personnel Management and the General Accounting Office, over its

TABLE 1
ARIMA Estimates of the Effects of Events Implementing
Merit Pay on Four Time Series of Organizational Performance

Performance Measure	Model ^a	Event Date	Trend ^b	Noise ^b	U_0^b	S_1^b
1: Days for a retirement/survivor's claim to be paid or denied (log) (n = 53)	(011)	—	—	.3495 (2.59)*	—	—
		Startup/January 1980	—	.1815 (1.25)	.0021 (0.55)	-1.1387 (13.59)*
		Training/September 1979	—	.3406 (2.54)*	-.0172 (0.51)	-.5176 (0.35)
		Payout/October 1980	—	.3280 (2.46)*	.0116 (0.35)	-.4364 (0.19)*
2: Days for an aged supplemental income claim to be paid or denied (log) (n = 53)	(010)	—	—	—	—	—
		Startup/January 1980	—	—	.0227 (0.52)*	-.3065 (0.18)
		Training/September 1979	—	—	.0566 (1.31)	.3040 (0.46)
		Payout/October 1980	—	—	-.0330 (0.83)	-.6413 (1.12)

TABLE 1 (continued)

Performance Measure	Model ^a	Event Date	Trend ^b	Noise ^b	U ₀ ^b	S ₁ ^b
3: Percentage of supplemental income claims with accurate documentation (log) (n = 49)	(011)	—	.1135 (2.15)*	.4366 (3.55)*	—	—
		Startup/January 1980	.1786 (2.99)*	.5258 (4.50)*	-.0522 (0.60)	1.0929 (11.95)*
		Training/September 1979	.0985 (1.86)	.4446 (3.58)*	.9942 (1.56)	-.4445 (0.83)
		Payout/October 1980	.1629 (2.62)*	.4398 (3.23)*	-.0625 (0.49)	1.1660 (4.87)*
4: Percentage of post-entitlement actions that took over 30 days (n = 48)	(010)	—	—	—	—	—
		Startup/January 1980	—	—	.0069 (0.45)	-1.1212 (7.99)*
		Training/September 1978	—	—	-.1572 (2.32)*	.7115 (4.18)*
		Payout/October 1980	—	—	.0229 (0.28)	.5131 (0.23)

^aModels follow the Box-Jenkins (p d q) notation where p = autoregressive order, d = the degree of differencing, and q = the moving average order.

^bt-ratio in parentheses

*p < .05

salient features; these disputes could have reduced managers' expectations that pay would be made contingent on measured organizational performance. In their surveys of managerial perceptions, Perry and Porter (1981) found that many managers did not trust the motives behind this compensation program, seeing it as political "window dressing" by the Carter and Reagan administrations; some managers apparently believed that this program was intended by the political leadership to communicate its dissatisfaction with bureaucratic inefficiency to the electorate rather than to actually reward high performance (Perry & Porter, 1981).

Third, in this research, as in so many real world quasi-experimental designs, it was not possible to study a comparable control group, although looking at 4 years of monthly performance measures gave us some control over rival hypotheses. The trend towards improved performance that existed before the implementation of merit pay was not significantly altered by training or implementation of the merit pay system, but, even though performance did not improve beyond existing trends, without a control group it was not possible to eliminate the rival hypothesis that performance would have deteriorated without the implementation of merit pay.

With the above caveats in mind, the evidence presented indicates that the implementation of merit pay had no significant effects on organizational performance. These empirical results, when combined with the absence in the scholarly literature of any reported successes of performance-contingent pay for managers, tentatively suggest that the concept of tying managerial compensation to organizational performance may deserve reexamination. It is possible that the concept itself may be invalid because (1) the nature of managerial work is too complex to be adequately captured in organizational performance measures, and (2) organizational performance is something over which managers have only limited control.

Much has been written about the open-ended, nonroutine nature of managerial work. Mintzberg (1973) found that chief executive officer jobs were characterized by brevity, variety, fragmentation, and an unrelenting pace, that managers were forced to react to immediate events, and that their schedules were frequently interrupted by crisis. Further evidence indicates that lower-level managers' jobs require even more frequent reactions to events (Chapple & Sayles, 1961) than do those of upper-level managers. Corroborating evidence can be found in the goal-setting literature: In his review of goal-setting research, Latham (1975) found that goal-setting programs for managers had encountered more problems than those for "simple jobs." He suggests that the complexity of managerial work may account for the lack of consistent success of managerial goal-setting programs.

These complexities suggest that objective measures of managerial performance may not be specifiable in advance. Therefore, someone — either peers, or more likely, the manager's supervisor — must judge performance; Lawler (1971) suggests that under these circumstances a combination of objective and subjective judgments be used in managerial evaluation, as was done in the merit pay program that figures in the present study. This approach may

solve the problem of devising fair performance appraisals for managers, but avoids the difficult question of whether a merit pay program based on such measures will improve organizational performance.

Finally, there is evidence from a body of organizational theory and research indicating that managers have little direct and immediate control over organizational performance. Pfeffer and Salancik (1978), among others, suggest that managerial actions account for as little as 10 percent of the variance in organizational performance and that more attention should be given to environmental influences on organizational performance. Mayors are elected to provide leadership for cities, yet research indicates that, compared to outside influences, they exert little control over city budgets (Salancik & Pfeffer, 1977); the appointment of new corporation presidents can make headlines in the business sections of newspapers, but Lieberman and O'Connor (1972) found leadership change to have no effect on organizational indicators such as profits; coaches of athletic teams are changed and win/lose records do not seem to improve (Brown, 1982). Control over organizational performance is complex, and the role of management is not simply to supervise employee productivity, even in organizations employing a simple technology like the distribution of social security benefits.

In conclusion, one study cannot definitively prove or refute the effectiveness of merit pay for managers. However, this study has illustrated the advantages of assessing attempts at organizational change over time. By examining performance for several years before and after an organizational change, it was possible to isolate the impact of a new merit pay program from any trends, transient improvements, and systematic oscillations in performance. Since organizational performance was improving before implementation of merit pay and continued to improve at a similar rate after that intervention, a simple before-and-after comparison would have led to the misleading conclusion that merit pay had a favorable effect on organizational performance. Future longitudinal studies of merit pay plans in other organizational settings should be able to determine under what conditions, if any, merit pay plans produce improvements in organizational performance.

APPENDIX

A variety of techniques for analyzing the impact of events affecting the performance measures were available. This appendix provides a discussion of alternative techniques and explains the advantages of Box-Jenkins intervention analysis. One alternative was to simply compare data from before and after the implementation of merit pay, but such a comparison would not have taken into account any upward or downward trends in the series. Thus, although improvement or decline in performance may have been occurring for some time independent of any changes in compensation to managers, before-and-after testing could have erroneously attributed changes to the implementation of merit pay. Therefore, it was desirable to construct a model that took account of trends in performance over time before testing the effects of merit pay.

A second alternative was to construct an econometric linear regression model fitting a regression line through the performance data over time, which could have been done by estimating two equations, one for performance data before the intervention and one for data after

intervention. The equations would have had time as an independent variable, and the differences in their slopes and intercepts would reflect differences in performance before and after the implementation of merit pay.

A third, equivalent alternative would have been to test the differences in the slope and intercept of the regression line predicting performance over time in one equation by using the following as independent variables: a dummy variable equal to zero before the intervention and to one afterwards; a variable representing time; and an interaction term constructed by multiplying the dummy variable by the time variable (Rao & Miller, 1971).

In either form, such a model is more sophisticated than simple before-and-after testing, in that it accounts for trends in the data and can include additional independent variables to explain organizational performance. However, such econometric time series models are inadequate if observations on the dependent variable are not independent of each other from one time point to the next. It is well-known that violations of the assumption of independence of observations result in incorrect estimates of the residual variance associated with the regression equation, and, even though coefficient estimates remain unbiased, significance tests of coefficients in the regression equation become unreliable. Modifications to regression analysis such as generalized least-squares regression (GLS) are possible, but GLS estimation can only take account of simple correlations of residual variance from one time point to the next.

Unfortunately, observations can be associated over time in several ways. A time series can be autocorrelated: that is, an observation may be correlated positively or negatively with the immediately preceding observation or with more than one previous observation. A time series can also exhibit a moving average process in which an observation is related to the previous observation, or to more than one previous observation, by a positive or negative random shock. Occasionally, a time series can be characterized by both autoregressive and moving average parameters.

The Box-Jenkins autoregressive integrated moving average (ARIMA) model — after detrending data, if necessary, by subtracting one value from the next — can take account of autoregressive and moving average processes. The ARIMA model differs from the better known regression model, in which independent variables are used to account for variance in the dependent variable, in that the former models a time series only in terms of autoregressive and moving average parameters that characterize a series itself. Given output from this modeling process — a residual series of data from which any recurring systematic components have been removed — a researcher can test an intervention into the series to see if it reflects a significant change above and beyond any recurring systematic components.

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AN INVESTIGATION OF SYSTEMATIC GENDER-RELATED ERROR IN JOB EVALUATION

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The present study manipulated the gender composition and the current pay level of one of three jobs in an experiment designed to address potential gender bias in job evaluation. Three samples of subjects participated. We obtained little evidence to suggest that gender composition influenced the evaluations of the manipulated job or the relative value assigned to the three jobs. Pay level, on the other hand, consistently influenced the relative value of the job evaluations and also influenced the absolute values of the total evaluation score and one compensable factor. There were few differences in results as a function of sample. Implications of the results for research on possible gender bias in pay-setting and for further research are discussed.

In the last several years, recognition of persistent wage differentials between men and women has become a significant and contested equal employment opportunity issue. The implications of this issue are important since the average women's salary is slightly less than 60 percent of the average men's salary (Milkovich, 1980). With over 40 million women in the labor force, the amelioration of this differential by raising women's wages to the level of those of men would require, other things being equal, an increase in the nation's wage bill of approximately \$250 to \$300 billion per year.

The issue has been addressed by representatives of the Equal Employment Opportunity Commission (EEOC), women's groups, and, increasingly, unions, in terms of the concept of *comparable worth*; different jobs that are of equal value to an employer are said to be of comparable worth. Although advocates of comparable worth have not unambiguously defined equal value (Schwab, 1980), it generally is discussed in terms of internal (job content) criteria rather than in terms of market criteria (Wallace & Fay, 1983). For example, job requirements like skill and effort, and job characteristics like

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working conditions are variables that have been considered to be internal criteria for the relative worth of jobs. Comparable worth advocates assume that payment based on variables such as these would reduce the wage differential between men and women.

Because the concept of comparable worth focuses on the assessment of job characteristics and requirements as appropriate criteria for establishing wage differentials, job evaluation — an administrative device for assessing such criteria in jobs and for arranging a pay-scale hierarchy based on them — has become prominent. At least in theory, job evaluation arrays jobs in terms of their content instead of their going market rates (Schwab, 1980).

Given the alleged purpose of job evaluation, it is somewhat ironic that the procedure has been the target of substantial criticism as a potential source of wage discrimination in jobs held predominantly by women. Specifically, the National Academy of Sciences (commissioned by the EEOC to study job evaluation in a comparable worth context) has hypothesized that job evaluation may be a source of discrimination when administrators establish pay differentials among jobs held predominantly by women compared to those held predominantly by men (Treiman, 1979; Treiman & Hartmann, 1981).

The present study was designed to investigate such a possibility. Specifically, we designed the study to examine two sources of error in job evaluation that could give rise to disadvantages in compensation for jobs held predominantly by women. The first source of error, direct bias, would occur if such jobs were undervalued relative to jobs in which men predominate as a function of gender composition per se. The second source of error, indirect bias, would occur if evaluation judgments were influenced by current or market wages that were themselves biased against jobs in which women predominate. We discuss each form of bias in more detail below.

Direct Bias

Direct bias (undervaluing of women's jobs) could occur either in an initial job analysis, or in evaluation of jobs in terms of compensable factors. Although several researchers have hypothesized that such direct bias occurs (Schwab, 1980; Smith, 1978; Treiman, 1979; Treiman & Hartmann, 1981), to date, corroborating evidence has generally not involved evaluation of jobs (Schwab, 1980; Treiman, 1979). Rather, with two exceptions, studies cited as showing evidence of gender bias in organizations have been those in which subjects have been asked to evaluate individual employees (make performance appraisals) or job applicants (make selection decisions).¹

In one of the two exceptions noted in the preceding paragraph, Mahoney and Blake (1979) had student subjects consider 20 occupations and then (1) recommend a salary for each, (2) rate each as masculine or feminine, and (3) rate each on job characteristics that would typically be employed in point

¹For reviews of research on biases regarding individuals, see Arvey (1979), Arvey and Campion (1982), and Nieva and Gutek (1980).

systems of job evaluation. After statistically controlling for effects attributable to job characteristics, they found that perceived femininity of an occupation explained a small, but statistically significant amount of variance in the salary recommendations, and concluded that the perceived femininity of an occupation influences judgments of occupational worth independent of other occupational characteristics.

Because Mahoney and Blake (1979) asked for an explicit masculine-feminine assessment, subjects may have been sensitized to the purpose of the study. In addition, the occupations selected for analysis were generally well known to the subjects, and judgments of pay were correlated ($r = .83$) with 1970 occupational earnings. Consequently, respondents' judgments may have simply reflected compensation realities rather than norms regarding gender-based compensation differentials.

In the other study involving jobs, Arvey, Passino, and Lounsbury (1977) had men and women college students evaluate one job using the Position Analysis Questionnaire (PAQ). Arvey and his colleagues manipulated the perceived gender associated with the job by showing participants photographs of the incumbent and having them hear a recorded man's or woman's voice describe the job. They found no gender-of-incumbent effect, and found a gender-of-evaluator effect ($p < .05$) on only one of the 32 PAQ dimensions.

Potential difficulties with the Arvey et al. study include ambiguity regarding whether subjects were evaluating jobs (the description) or incumbents (the photographs). Also problematical is the fact that the experiment involved only one job. Employers use job evaluation systems to estimate job hierarchies, or the relative standings of jobs, as a basis for pay structures. The main issue we seek to address is not the absolute value assigned to a particular job, but how evaluation of a job locates it in a distribution of evaluations.

Indirect Bias

Existence of the second potential form of gender bias, indirect, is speculative, in that it has not been previously hypothesized, and furthermore, is contingent on another hypothesis of the comparable worth advocates. Specifically, advocates have argued that current market wages are biased against women in that jobs held predominantly by women are systematically underpaid relative to jobs held predominantly by men (Blumrosen, 1979; Treiman & Hartmann, 1981). If that is true, and if organizations validate their job evaluation systems on the basis of market wage distributions (as is, according to Treiman, 1979, typical), then the resulting wage predictions would be likely to give rise to bias against jobs held predominantly by women (Schwab & Wichern, 1983).

However, even if firms do not validate job evaluation systems on the basis of existing market wage distributions, bias might occur, if the going market wage of certain jobs influenced evaluators' judgments of these jobs on compensable factors. Although, to our knowledge, no one has studied this possibility in a job evaluation context, there are both conceptual (Jaques,

1961) and empirical (Mahoney, 1979) reasons to believe that perceptions of job worth correspond to the current wage rates associated with those jobs. The present study also investigated this possible source of bias.

METHODS

Participants and Procedure

The study's initial sample included 49 advanced undergraduate and graduate students in a second-level compensation course at the University of Wisconsin-Madison. Two additional groups — 69 graduate students in two graduate-level personnel courses at Purdue University, and 74 undergraduate students in a beginning personnel course at Purdue — then participated in replications.

Each group first heard a one-hour lecture on purposes and methods of job evaluation, and then received a reading assignment providing an overview of the Midwest Industrial Management Association (MIMA) point system for office jobs that included definitions of three of this system's compensable factors (education, experience, and complexity), factor-level definitions, and point values. Participants were instructed to study these materials before the next class, when they would use them to evaluate three jobs. We included only three compensable factors to make the evaluation task manageable in the class time available, choosing these three factors because they accounted for most of the total point-score variance in the MIMA office job system (Ash & Crnic, as reported in Treiman, 1979: 10).

At the next class meeting, participants received a description of, and background information about, an organization (a large Midwestern bank) and description of three jobs in its commercial banking area: loan commitment specialist, banking representative, and loan collateral auditor. We chose these three jobs and the commercial banking area because we assumed that participants would have little familiarity with them, and hence have few *a priori* expectations about either their gender composition or current pay levels. The background information contained technical information needed to understand the descriptions (e.g., the meaning of "cross-selling"). Embedded in this background information were data on the tenure, gender, and current salary of present job incumbents.

We experimentally varied and crossed gender composition and current pay rate for the banking representative job only. In half the job background descriptions, we identified 3 of the 20 current employees as women, and, in the other half, identified 3 of the 20 as men. Likewise, in half the cases, we reported the current salary to be \$18,222, and, in the other half, as \$27,320. For all conditions, we described the loan commitment specialist job as filled by two women and as paying \$12,900, and described the loan collateral auditor job as filled by two women and two men and as paying \$20,790.

We randomly distributed evaluation booklets containing job descriptions, manipulated background information (as specified), and bank overview data to the participants, who were instructed to read the background information

and to then evaluate each job on the three compensable factors. We did not ask them to evaluate each job independently, and observed some paging back and forth between jobs as they worked. After completing the task, participants turned over their evaluation booklets and answered eight multiple choice questions pertaining to the bank and its jobs, which included questions checking on participants' ability to recall the pay level and the gender composition of the manipulated job. Participants took between 20 and 35 minutes to complete the entire task, with a mean time of about 25 minutes.

We weighted each compensable factor following the MIMA manual to obtain three factor scores for each job by subject, which we summed to obtain a total evaluation score for each job. The 12 resulting scores — (3 compensable factor scores + 1 total score) \times 3 jobs — constituted the dependent variables of the study.

As initial analysis suggested some differences in evaluations as a function of sample, the analysis reported here includes sample as an independent variable. To test whether the manipulations had an impact on the absolute ratings of the banking representative job, we performed univariate between-subjects analyses of variance (ANOVA). The model we used to determine whether our manipulations had an impact on the relative scores of all three jobs was a 2 (pay levels) \times 2 (gender composition levels) \times 3 (jobs) \times 3 (samples) factorial design. Pay level, gender composition, and samples constituted between-subject factors; jobs represent a within-subject factor. To obtain equal cell sizes within each sample, we randomly chose and deleted one observation from the Wisconsin sample, 13 from the Purdue graduate sample, and 6 from the Purdue undergraduate group for final sample sizes of 48, 56, and 68, respectively.

To determine whether univariate (ANOVA) or multivariate (MANOVA) analysis was appropriate to test for the relative effects of the manipulations, we performed a compound symmetry test (Bock, 1963). Since the null hypothesis was rejected ($p < .05$), we used MANOVA as our principal analytical technique to assess the full factorial model.

RESULTS

Manipulation Recall

Sixty-nine percent of the respondents correctly recalled the gender composition of the manipulated job for both conditions. Eighty-seven percent of the subjects correctly recalled the pay level of the manipulated job in the low pay-level condition, and 91 percent correctly recalled it in the high pay-level condition. Thus, most of the participants retained the manipulated information even after the experiment, although, of course, this says nothing about whether they responded to this information.

Main Study

Table 1 shows results of the between-subjects tests on the manipulated job only. Regarding the two manipulations that bear on the issues of interest

to this study, the results show that the gender manipulation had no main effect on any of the compensable factors or on total scores. On the other hand, the pay manipulation significantly ($p < .01$) influenced the total ($\omega^2 = .05$) and education factor ($\omega^2 = .06$) scores. Scores assigned to the banking representative job were higher when the salary was reported to be \$27,320 than when it was reported to be \$18,222. Table 1 also shows a significant ($p < .05$) interaction between pay and sample on the experience factor. Post hoc inspection of the means revealed that the Wisconsin and Purdue undergraduates assigned lower scores to the experience factor when pay was reported as lower, but, in the same case, Purdue graduates assigned higher scores. We have no explanation for this result, and, in any event, the effect accounted for trivial variance in the evaluations ($\omega^2 = .01$). Overall then, pay had a modest effect on the evaluations of the representative job.

The within-subjects analysis summarized in Table 2 pertains to whether our gender and pay manipulations affected the *relative* evaluation of jobs. In this regard, the statistically significant ($p < .01$) main effect of jobs on all compensable factors and the total is of little consequence since it simply indicates that the participants differentiated among the three jobs. More relevant for this study are the two-way interactions (job \times pay level and job \times gender composition) since they indicate whether the manipulations influenced the resulting hierarchy of job evaluation scores. Table 2 shows that the two-way job \times pay level interaction is statistically significant ($p < .01$) for each of the compensable factors and the total score while the job \times gender composition interaction generally is not.

Table 3 illustrates how our pay level manipulation interacted with the three jobs to influence the three compensable factors and total scores. It shows that when we reported the representative (manipulated) job as having a salary of \$18,222 (low pay), its compensable factor and total evaluation scores were below those assigned to the auditor job paying \$20,790. However, when the representative job was described as having a salary of \$27,320 (high pay), its compensable factor and total scores were above those assigned to the auditor job. Thus, the relative ordering of factor and total scores of the representative and auditor jobs varied, depending on the salary level reported for the representative job.

By contrast, gender composition interacted ($p < .05$) with jobs only on the complexity factor. Inspection of the means revealed that the scores for men and women on the manipulated job were identical ($\bar{x}_w = \bar{x}_m = 63$). However, the specialist and auditor jobs received higher evaluations when the manipulated job was held predominantly by women ($\bar{x}_w = 44$, $\bar{x}_m = 42$; $\bar{x}_w = 68$, $\bar{x}_m = 64$, respectively).

Table 2 also reveals a significant ($p < .05$) three-way gender sample \times job interaction. We detected no interpretable pattern through a post hoc inspection of the means. Moreover, squared canonical correlations indicated that a linear composite of this interaction accounted for only 1 percent of the variance in a linear composite of the complexity factor scores. We also

TABLE 1
Results of Between-Subjects Analyses of Variance
for Manipulated Banking Representative Job

Source	df	Total		Experience		Education		Complexity	
		Means	F	Means	F	Means	F	Means	F
Gender	1	42.0	.09	58.1	.33	188.4	2.91	0.1	.00
Pay	1	4350.1	9.31**	672.1	3.77	753.5	11.64**	158.3	1.70
Sample	2	719.1	1.54	165.8	.93	125.7	1.94	99.6	1.07
Gender × Pay	1	652.5	1.40	58.1	.32	188.4	2.91	17.6	.19
Gender × Sample	2	232.2	.49	276.6	1.55	34.8	.54	117.8	1.27
Pay × Sample	2	889.6	1.90	707.4	3.97*	45.3	.70	7.5	.08
Gender × Pay × Sample	2	316.4	.68	10.2	.06	32.0	.49	84.5	.91
Error	160	467.1	—	178.0	—	64.7	—	93.0	—

*p < .05

**p < .01

TABLE 2
Total Evaluation Variance as a Function
of Gender, Pay, Sample,^a and Jobs^b

Source	Total			Experience			Education			Complexity		
	Wilks' Lambda	Multivariate F		Wilks' Lambda	Multivariate F		Wilks' Lambda	Multivariate F		Wilks' Lambda	Multivariate F	
Job	.129	538.13**		.344	151.83**		.114	620.19**		.184	353.14**	
Gender \times Job	.985	1.18		.993	.56		.970	2.48		.961	3.20*	
Pay \times Job	.738	28.29**		.866	9.26**		.754	25.94**		.787	21.46**	
Sample \times Job	.986	.56		.990	.40		.990	.41		.960	1.66	
Gender \times Pay \times Job	.966	2.80		.982	1.41		.976	1.98		.982	1.47	
Gender \times Sample \times Job	.943	2.37		.968	1.29		.951	2.04		.940	2.48*	
Pay \times Sample \times Job	.960	1.64		.978	.89		.980	.81		.932	2.88*	
Gender \times Pay \times Sample \times Job	.989	.43		.992	.31		.970	1.20		.985	.60	

^aBetween subjects

^bWithin subjects

* $p < .05$

** $p < .01$

TABLE 3
Average Evaluations as a Function
of Job and Current Pay^a

Job and Current Pay	Total	Experience	Education	Complexity
Specialist (\$12,900)	124.6	50.0	31.0	43.6
Representative (\$18,222)	189.2	68.2	59.0	62.1
Auditor (\$20,790)	209.6	70.4	66.0	73.1
Specialist (\$12,900)	122.6	48.6	31.2	42.6
Representative (\$27,320)	199.2	72.1	63.1	63.9
Auditor (\$20,790)	182.8	62.8	59.3	60.4

^aOnly current pay of the representative job was manipulated, resulting in a different ordering of jobs by current pay.

obtained significant ($p < .05$) three-way pay \times sample \times job interaction accounting for 7 percent of the variance in a linear composite of the complexity scores. A post hoc inspection of the means suggested that the Purdue undergraduate participants were relatively more sensitive to the low pay condition in their evaluations of the specialist and auditor jobs, and that the Wisconsin participants were relatively more responsive to the high pay condition in their evaluation of the specialist and representative jobs, but relatively less responsive regarding the auditor job. As with the significant two-way pay \times sample between-subjects interaction, no explanation for these sample differences seems plausible.

DISCUSSION

The present study was designed to investigate two potential sources of error in the evaluation of jobs, either of which could lead to gender bias in the setting of wages for jobs performed predominantly by women. The first of these, called direct bias, would occur if jobs held predominantly by women were underevaluated relative to jobs held predominantly by men, other things being equal. We found little evidence that this was a serious problem in the present study. Gender composition did not have a statistically significant main effect, nor did it interact with any of the other independent variables in influencing the absolute evaluations of the manipulated job.

In addition, gender composition had little demonstrable impact on the hierarchy participants made for the three jobs evaluated. On only one of the three compensable factors studied — complexity — did gender composition interact at a statistically significant level with the jobs involved to influence the evaluations. This finding may suggest that certain compensable factors are more susceptible to gender bias than others, a possibility certainly deserving further study. Nevertheless, the small amount of variance this effect accounted for, combined with the small and basically uninterpretable sample interaction, leads us to suspect that the finding is a statistical artifact.

Results substantially supported existence of the second source of error—indirect bias, caused by the effect of current pay on job evaluation results. Current pay accounted for 5 and 6 percent of the variance in the absolute evaluations of the manipulated job on the total score and education factors, respectively.

The pay \times job interactions (representing the effect of current pay on the relative hierarchy of jobs) were statistically significant for the total evaluation score and for all three of the individual compensable factors; the relative mean evaluations of banking representative (manipulated) versus auditor jobs conformed to the relative salary levels reported in all cases. That is, when we reported the banking representative job as having a higher salary than the auditor job, mean job evaluation scores for the representative job were higher than those for the auditor job; likewise, when the banking representative job had the lower reported salary, it had lower evaluations. Moreover, this effect was substantial. Squaring the canonical correlation coefficients indicated that a linear composite of the job \times pay interaction accounted for 10, 25, 21, and 26 percent of the variance, respectively, in linear composites of the experience, education, complexity, and total job scores.

In summary, we found little evidence that gender composition of jobs, by itself, influenced job evaluations. On the other hand, we found strong evidence that pay level influenced evaluations of jobs, and especially the relative hierarchy of jobs. The latter finding has important policy implications since it suggests a form of “predictor contamination” (i.e., criterion scores influence prediction evaluations). If this generalizes to compensation specialists in organizations, and if, as comparable worth advocates argue, current pay structures already reflect gender bias, the implications are especially troublesome. Biased market pay structures could work backward through the job evaluation process to produce relatively deflated evaluations for jobs held predominantly by women without the need for any direct bias based on gender composition.

Given the very significant policy overtones of the issues investigated in the present study, two final caveats are necessary. First, this study, along with the earlier Mahoney and Blake (1979) and Arvey et al. (1977) investigations, employed college students as subjects. These subjects certainly could have been motivated differently than compensation specialists conducting job evaluations in organizations. We do have evidence that students and personnel practitioners similarly view the gender of a job to be primarily a function of the gender composition of the incumbents (Krefting, Berger, & Wallace, 1978a, 1978b). We also have evidence that business students (who were studied here) and managers provide similar estimates of “appropriate” salary differentials between jobs (Mahoney, 1979). However, we do not yet know whether such similarities also extend to similar evaluations of job content as a function of gender composition and current pay differentials—specifically in a job evaluation context. Finding out must necessarily wait on obtaining access to evaluators in ongoing organizations.

Second, although the job descriptions used in this study were from an actual bank, it is probable that job evaluators often have additional information when they make their job assessments; for example, they may observe jobs or discuss them with a supervisor. Such additional information may serve to reduce (or to increase) the effects of such error sources as current pay level or gender composition.

Consequently, until investigators can perform studies on actual job evaluators in the evaluator's own environment, the external validity of existing studies must remain in question. However, when and if investigators do gain access to organizations using job evaluation, our results would have two important design implications for them. First, investigations of job evaluation should include multiple jobs so that relative effects of bias may emerge from the analysis. Our results indicate that analysis of only absolute effects on a manipulated job may not capture the full impact of error sources on pay structures. Second, because of the possible bias that exists in current pay structures and because our results found consistent evidence of an effect for relative pay level, future research should investigate this potential source of bias and not merely the effects of gender composition.

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REACTIONS TO FEEDBACK: THE ROLE OF ATTRIBUTIONS

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This study tested reactions to feedback in an experimental simulation. Feedback specificity and information that could be used to make causal inferences were manipulated through varying information on consistency, distinctiveness, and consensus. As predicted, subjects rated specific feedback more positively than they rated nonspecific feedback, and preferred feedback that suggested an external cause of poor performance to feedback that suggested an internal cause. However, the latter was not preferred to nonspecific feedback.

Research on feedback, a topic that has received considerable attention in the last few years, has provided some data on how recipients react to feedback. Ilgen, Fisher, and Taylor's review (1979) presented a model describing relationships between types of feedback and the reactions they generate in terms of behavior, attitudes, and performance. Subsequent studies demonstrated that individuals preferred specific feedback to general feedback (Ilgen, Mitchell, & Fredrickson, 1981a) and that timing, specificity, and frequency were all associated with degrees of satisfaction and perceptions of the helpfulness of appraisals (Ilgen, Peterson, Martin, & Boeschen, 1981b). However, one area that has not been investigated is how recipients of feedback react to feedback that provides information from which they can make inferences about the causes of their level of performance.

In addition to research on feedback, this study draws on research in attribution theory, which addresses notions of causality. This theory, originally described by Heider (1958), has recently received considerable attention in the area of organizational behavior (Cummings, 1982; Lord & Smith, 1983). Investigators have addressed many topics, but the most heavily researched area has perhaps been leadership (McElroy, 1982; Mitchell, Green, & Wood, 1981). Although much of this work has concentrated on how supervisors arrive at causal interpretations for subordinates' performance, essentially nothing has appeared on how subordinates react to these causal judgments. Thus, neither feedback research nor organizational behavior research on attribution has looked at reactions to feedback that provides

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attributional information. Similarly, in social psychology, "little actually is known about the reactions of observer's causal judgements for their own or others' behavioral outcomes" (Harvey & Weary, 1984: 443). In order to demonstrate the logic for the hypotheses tested in our research, we need to briefly review the nature and sources of judgments.

Kelley (1967) suggested and labeled the three dimensions most frequently used for making causal attributions — consistency, distinctiveness, and consensus. The following hypothetical situations identify these three dimensions. Individuals who have performed poorly on a task might receive feedback from superiors, about (1) whether or not they have performed poorly on this task on previous occasions (consistency); (2) whether or not they have performed poorly on other tasks as well (distinctiveness); and (3) whether or not they performed at a lower level on this task than others did (consensus). Here is a more specific example of how these dimensions shape variations in causal attribution:

John has failed an exam, and because he wants to know why his performance was so low, he approaches the teacher for information. The teacher reminds John that he has failed two out of three of the tests (high consistency). This information is likely to suggest that something about John (e.g., lack of effort or ability) was the problem — an internal attribution. If, on the other hand, the teacher tells John that he has done well on previous tests (low consistency), his inference would likely be that something about the test or the situation, (e.g., the test was too hard) was the problem — an external attribution. If the teacher reminds John that he has performed poorly in other classes (low distinctiveness), John might make a more internal attribution than if he were reminded that he has done well in other classes (high distinctiveness). Finally, if the teacher tells John that all other students did well on the test (low consensus), he is more likely to make an internal attribution than if he learns that everyone else also failed (high consensus).

Thus, the pattern of high consistency (failure on past quizzes), low distinctiveness (failure in other courses), and low consensus (being the only student who failed) is likely to lead to an internal attribution and the opposite combination (low consistency, high distinctiveness, and high consensus) will lead to an external attribution.

Both feedback providers and feedback recipients can use the dimensions of consistency, distinctiveness, and/or consensus to make attributions about cause of the poor performance. Similarly, Larson has argued that "these same factors [consistency, distinctiveness, and consensus] may influence a supervisor's performance feedback behavior" (1984: 48). That is, providers of feedback (e.g., supervisors) may frequently use information that can be categorized as concerning either consistency, distinctiveness, or consensus to provide feedback. Recipients of feedback can use such information both to understand why feedback providers make the judgments they do, as well as to come to conclusions about the cause of their problems.

Thus, we argue that feedback containing consistency, distinctiveness, and consensus information should seem more valuable to recipients than

feedback that does not include such information. In general, more information is better, because it helps individuals make more accurate diagnoses. However, we expect that reactions to feedback will vary depending on whether information suggests that characteristics internal to the individual (effort, ability) were the likely causes for performance, or whether factors external to the individual (a tough test) were the likely causes. Since those who receive information suggesting internal causes for poor performance are more likely to blame themselves than are those who receive feedback suggesting external causes, individuals should react more positively to information implying external causes than to information implying internal causes for poor performance. This prediction is consistent with work on self-serving attributional biases (Harvey & Weary, 1984). However, the research on self-serving biases has not addressed the issue of how individuals react to ambiguous information—information that does not include causal implications. Social learning theory (Bandura, 1971) may be relevant here as it suggests that people seek information that will help to improve performance. Similarly, research by Ilgen and his colleagues (Ilgen et al., 1981a) found that poor performers preferred specific, negative, feedback to nonspecific feedback. Therefore, we would argue that individuals will prefer accurate, though personally damaging feedback — that is, information that implies internal causes for poor performance — to nonspecific or ambiguous information.

In the following investigation, we manipulated feedback to produce three conditions (no, low, and high) of consistency, distinctiveness, and consensus, crossing conditions to create a $3 \times 3 \times 3$ design having 27 cells. We presented each cell as a variation of a hypothetical situation, a professor providing feedback to a student, choosing this situation for its relevance and realism to our subjects, who were all students. The study tested three hypotheses based on the ideas presented earlier in this article:

Hypothesis 1: Students will rate specific feedback more positively than they will rate nonspecific feedback: that is, they will rate information that helps them assess the cause of poor performance more positively than information that does not do so.

Hypothesis 2: In our complete design (all 27 cells), there should be main effects for consistency, distinctiveness, and consensus in measures derived from students reactions to feedback. More specifically, we predict that students ratings of feedback will be more positive when they receive information implying external causes for poor performance than when they get information implying internal causes.

Hypothesis 3: Combining Hypotheses 1 and 2, we predict that students will rate specific information implying external causes more positively than they will rate specific information implying internal causes; the latter will,

however, be rated more positively than will be information that does not suggest causes for the poor performance.

METHODS

Subjects

One-hundred and sixty-five undergraduate students from a large western state university and 138 undergraduates from a small eastern college participated in the research. All students at both schools were enrolled in business courses and most were business majors. After 5 subjects with missing data were removed, the total N was 298 ($n = 11$ for each cell except for one for which $n = 12$).

Procedures

Students were asked in class to respond to several questions about a case, one of 27 possible cases, each describing one variation of our hypothetical situation. The study was run early in the term so that students' responses would not be influenced by their attitudes toward a particular course or instructor. Before passing out cases, the experimenters told the students that:

We as faculty are often asked by students to provide feedback on course performance, such as exam grades. However, little is known about students reactions to feedback given by professors. In order to begin understanding these reactions to faculty feedback, I would like you to read the following case and respond to the questions. In the case, a professor gives a student feedback on an exam that the student has just taken. Try to put yourself in the student's position. React to the professor's feedback as you think you would if you were that student.

These instructions also appeared on cover sheets stapled with the cases and questionnaires. Since cover sheets were the same regardless of the experimental condition the case represented, experimenters did not know which variation any given subject received. The 27 cases were evenly distributed among the 10 classes participating in the research so that class membership would not confound experimental conditions. Students had as much time as they wished to read the case and answer the questions about it. Experimenters then collected the materials and thanked the students for their participation. It was clear from students' comments after the materials had been collected that they thought the sole purpose of the research was to help faculty give feedback to students. Several weeks later, the experimenters discussed the experiment's design and results with the subjects.

The Case and Manipulations

The text of the case for all 27 conditions began: "Imagine that you have just received a 62 (D) in an important course in your major. You are concerned about this poor test score and decide to see your professor about it. Your professor mentions that . . .". The ellipsis represents the text of the professor's feedback to the student, within which we manipulated the

independent variables with a few sentences that conveyed no, low, or high levels of consistency, distinctiveness, and consensus. We wrote 9 sections of these texts, one section for each of the three levels of the three independent variables, and combined these nine sections appropriately to construct the 27 conditions. Thus, wording for a particular level of a factor—low distinctiveness, for instance—was identical for all nine conditions that included low distinctiveness. We operationalized low and high levels of consistency, distinctiveness, and consensus in terms of Kelly's (1967) work. Information pertaining to scores on previous exams in the class defined consistency; for example, for high consistency the wording was: "Your performance on the test was indeed very poor, in fact it was not any better than your scores of 61 and 67 on the first two exams." Information concerning performance on writing a paper defined distinctiveness; for example, the wording for high distinctiveness was: "I notice that you had a high grade on the research paper." Information pertaining to the scores of other students on the exam in question defined consensus; the wording for consensus was: "Eighteen out of 21 students in this class had a higher score than you." For the conditions of no consistency, distinctiveness, and consensus, texts gave information that was not relevant to these factors; for example, for no consistency: "Your performance on the test was indeed very poor; you missed nearly 40% of the questions on the test."

In our complete 27-cell design, some cells provided information that was attributionally homogeneous, either all external or all internal. For example, the cell combining low consistency, no distinctiveness, and high consensus was attributionally homogeneous because both pieces of attributional information provided suggested external causes. (When we discuss our results, we will label this cell 1 no/2 external.) In other cells information was attributionally heterogeneous, with some information suggesting internal causes and some suggesting external causes. For example, the cell combining high consistency (internal), low distinctiveness (internal), and high consensus (external) provided attributionally heterogeneous information because two pieces of information suggested internal causes and one suggested an external cause. We will label this 2 internal/1 external.

Measures

Manipulation checks. We checked the consistency and distinctiveness manipulations with the question, "To what extent did the professor take into account your previous work in this class?" (scaled 1 = did not take previous work into account at all, to 10 = took all previous work into account). The question, "To what extent do you feel that the professor's comments concerning your test score were useful for comparing yourself to others in the class?" (scaled 1 = not at all useful, to 10 = extremely useful), measured the consensus manipulation. To check subjects' perceptions of the degree to which the attributional information presented was internal or external, we asked them for a self-attribution explaining the poor exam grade (scaled 1 = entirely my own fault, to 10 = entirely caused by situational factors).

Measurement of dependent variables. Subjects responded to six questions (on 10-point scales) regarding the feedback: (1) How helpful were the professor's comments in understanding why you scored a 62? (scaled from not at all helpful to extremely helpful). (2) How fair were the professor's comments? (not at all fair to extremely fair). (3) To what extent did you agree with the professor's comments? (do not agree at all to completely agree). (4) How much do you feel you would like the professor? (would not like at all to would like very much). (5) How hard would you study for the final? (would not study hard at all to would study very hard). (6) Overall, how would you rate the professor's feedback? (very poor feedback to excellent feedback).

On the basis of conceptual and empirical similarities, we constructed two composite measures from the dependent variables. We summed scores for helpfulness of feedback and overall quality of feedback — the most general and least affective of the dependent measures — for feedback rating ($r = .53$). We also summed scores for measures of affective responses to the feedback (fairness, liking the professor, and agreeing with the professor) to form another composite, feedback affect (average $r = .51$). The behavioral intentions item (expected effort on studying for the final) is conceptually different and not highly related to the other items (average $r = .17$), so we did not combine it with any of the other items.

RESULTS

School Effects

To test for effects of school on the two manipulation checks and the three dependent variables, we ran $2 \times 3 \times 3 \times 3$ (school \times consistency \times distinctiveness \times consensus) analyses of variance. These analyses could also be interpreted as tests of experimenter effects since one experimenter collected all the data at the western university and the other experimenter collected all data at the eastern college. The main effects for school were significant for the consensus manipulation check ($F_{2,244} = 8.11, p < .01$); feedback rating ($F_{2,244} = 7.14, p < .01$); and feedback affect ($F_{2,244} = 7.45, p < .01$). Means for students at the eastern college were higher than those for the western students on all three measures. The main effects for the other manipulation checks and the behavioral intention item were not significant. Only one of the possible interactions between school, consistency, distinctiveness, and consensus on the manipulation checks and dependent measures was significant. However, the significant main effects were pervasive enough to warrant statistical control. Therefore, we standardized all manipulation checks and dependent measures within each school.

Manipulation Checks

Our manipulations were successful. Means for the question about the extent to which the professor took previous work into account were lower in the no-consistency condition than in the low- or high-consistency conditions ($F_{2,271} = 20.37, p < .01$) and lower in the no-distinctiveness condition

than in the low- and high-distinctiveness condition ($F_{2,271} = 13.15, p < .01$).¹ Means for subjects in the no-consensus conditions were lower than those for subjects in the low- and high-consensus conditions on the manipulation check for provision of information useful for comparing yourself to others in the class ($F_{2,271} = 98.39, p < .01$).

Subjects' perceptions of the nature of the cause, internal versus external, of their poor examination grades agreed with the manipulations. As Table 1 shows, subject attributions for the cell with three pieces of internal information (high consistency, low distinctiveness, and low consensus) were more internal ($\bar{x} = -.879$) than attributions for the cell with three pieces of external information (i.e., low consistency, high distinctiveness, and high consensus) ($\bar{x} = .705$). In this and other tables, we have combined cells to form groups. For instance, in Table 1 we grouped cells on the basis of the amount (number of pieces) of homogeneous attributional information; thus, group 1 contains only the 3 internal cells; group 2 contains the three cells that can be called 1 no/2 internal, etc. In general, results show that the fewer pieces of internal information or the more pieces of external information, the more external a subject's self-attribution will be. Subjects' perceptions of the attributional information presented agreed with Kelley's (1967) theoretical work and so gave us confidence in our manipulations.

Feedback Specificity

We predicted that subjects would rate feedback containing attributional information—specific feedback—more positively than they would rate feedback containing no attributional information—nonspecific feedback. This prediction implied comparing measures of dependent variables for the cell containing no attributional information with those groupings of cells providing varying amounts of internal or external attributional information. To make this comparison, we performed two different tests. First, we considered the effects of more information, either homogeneous or heterogeneous, on the three dependent variables. Conducting these ANOVAs resulted in a significant effect only for feedback rating ($F_{3,294} = 3.04, p < .03$). As Table 2 shows, the mean for the 8 cells with three feedback dimensions (group 4) was .245; for the 12 cells with two feedback dimensions (group 3) it was -.094; for the 6 cells with one feedback dimension (group 2) it was -.063; and for the cell with no specific feedback (group 1) it was -.447. Clearly, students saw specific feedback as more helpful and of higher quality than nonspecific feedback. However, feedback affect and behavioral intentions were not related to feedback specificity.

In the second test of this hypothesis, we looked at only cells with homogeneous information. More specifically, we compared the cell providing no attributional information with the following cell groupings: 2 no/1 internal, 1 no/2 internal, 3 internal, 2 no/1 external, 1 no/2 external, and 3 external. To

¹In retrospect, since previous work encompasses both consistency and distinctiveness, we recognize that we should have had two manipulation checks; however, the one-item check does provide some support for the two manipulations.

TABLE 2
Results of One-Way Analyses of Variance
for Feedback Specificity

Dependent Variables	Means ^a				$F_{3,294}$	Eta^2	Variance Accounted for in Linear Component
	Group 1 no feedback dimensions (<i>n</i> = 11)	Group 2 1 feedback dimension (<i>n</i> = 67)	Group 3 2 feedback dimensions (<i>n</i> = 132)	Group 4 3 feedback dimensions (<i>n</i> = 88)			
Feedback rating	-.447	-.063	-.094	.245	3.04*	.03	.02
Group comparisons*: G4 > G1 and G3							
Feedback affect	-.139	.058	-.066	.072	.48	.005	.001
Group comparisons*: None significant							
Behavioral intentions	.114	.041	.065	-.138	.48	.008	.001
Group comparisons*: None significant.							

^aDependent variables were standardized within each school.

**p* < .05



avoid confounding, we excluded cells providing heterogeneous attributional information (e.g., 2 external/1 internal) from this analysis.

In support of Hypothesis 1, subjects rated specific feedback (attributional information provided) more positively than nonspecific feedback (no attributional information provided). As Table 3 shows, all means for feedback rating were more positive for cells providing one or more pieces of attributional information (groups 2-7, with mean scores ranging from $-.431$ to $+.719$) than was the mean for the no-information cell (group 1, $\bar{x} = -.447$). Planned comparisons indicated statistically significant differences for cells providing two or three pieces of external information. For behavioral intentions and feedback affect, the nature of the attribution—internal or external—appeared to be much more important than the amount of attributional information. In general, these data showed that subjects felt that the quality and helpfulness of feedback were greater when the feedback was specific than when it was not specific. However, the nature of the attribution also seemed to affect the dependent variables, especially behavioral intentions. We will now examine the attributional content of the feedback in greater detail.

Attributional Content of the Feedback

When we look at the complete $3 \times 3 \times 3$ design, we see main effects for distinctiveness and consensus on feedback rating, and for consistency and distinctiveness on feedback affect, as Table 4 illustrates. For behavioral intentions, there was a main effect for consistency. These results, supporting Hypothesis 2, indicate that, across the three dependent measures, students' ratings differed depending on whether they received no-, low-, or high-consistency, distinctiveness, and consensus information. Planned comparisons showed that, in general, they rated feedback implying an external cause (i.e., low consistency, high distinctiveness, or high consensus) more positively than feedback implying an internal cause (i.e., high consistency, low distinctiveness, or low consensus), as had been expected. For example, high distinctiveness (implying an external attribution) was rated more positively than low distinctiveness (internal attribution) for all three dependent variables. High consistency (external attribution) was rated more positively than low consistency (internal attribution) for feedback affect and behavioral intention. High consensus (external attribution) was rated more positively than low consensus (internal attribution) for feedback rating. The planned comparisons also showed that, for three out of nine possible comparisons, specific feedback implying an external cause (i.e., low consistency, high distinctiveness, or high consensus) was rated more positively than nonspecific feedback.

We also predicted that subjects would rate specific feedback implying an internal cause (i.e., high consistency, low distinctiveness, or low consensus) more positively than nonspecific feedback (i.e., no consistency, no distinctiveness, or no consensus). However, the planned comparisons did not reveal differences between ratings of specific internal feedback and nonspecific feedback. Taken together, these results provide partial support for

TABLE 4
Results of Analysis of Variance for Consistency
Distinctiveness and Consensus Information

Dependent Variables	Marginal Means ^a for Main Effects										$F_{2,271}$ ^b		
	Consistency			Distinctiveness			Consensus			Consistency		Distinctiveness	Consensus
	No (n = 100)	Low (n = 99)	High (n = 99)	No (n = 100)	Low (n = 99)	High (n = 99)	No (n = 99)	Low (n = 99)	High (n = 100)				
Feedback rating	-.070	.106	-.035	-.143	-.283	.428	-.143	-.115	.256	.98	15.80** (.09)	5.62** (.04)	
Group comparisons: [*]				H > N, H > L			H > N, H > L						
Feedback affect	-.002	.230	-.228	-.099	-.243	.325	.047	.025	-.071	5.60** (.04)	8.80** (.06)	.42	
Group comparisons: [*]	L > H			H > N, H > L									
Behavioral intentions	.108	.134	-.239	.053	-.168	.118	.017	.023	-.036	4.52** (.03)	2.34	.12	
Group comparisons: [*]	N > H, L > H			H > L									

^aDependent variables were standardized within each school.

^bNone of the interactions were significant. Eta² values appear in parentheses.

* $p < .05$

** $p < .01$

Hypothesis 3. We made no hypotheses concerning interactions and found none of the interactions between consistency, distinctiveness, or consensus to be significant for any of the dependent measures.

Although these results indicate that specific external feedback is rated more positively than both specific internal feedback and nonspecific feedback, the analyses confounded internal with external information. For example, although there was a main effect for distinctiveness on feedback rating, some of the subjects participating in cells with high-distinctiveness information (external) also received high-consistency information (internal) and low-consensus information (internal). It is possible that the internal consistency and consensus information may have weakened the effect of the external distinctiveness information. To evaluate attributional homogeneity—all external or all internal information—separately and to compare it with attributional heterogeneity—mixed internal and external information—we made two types of comparisons. First, looking at Table 3, which included only homogeneous information, we found significant effects for all three dependent variables. Groups 2, 3, and 4 include cells containing one to three items of internal information, and groups 5, 6, and 7 include cells containing one to three items of external information. Examining the three internal-feedback groups for the three dependent variables revealed that eight of the nine means were negative. For the three external-feedback groups eight of the nine means were positive. We concluded that homogeneous feedback information implying external causes is clearly rated more positively than is homogeneous information implying internal causes.

We made the second set of comparisons between means of dependent variables for the following groups of cells: group 1, 3 internal; group 2, 2 internal/1 external; group 3, 2 external/1 internal; and group 4, 3 external. As Table 5 shows, values for feedback rating for the 2 external/1 internal cells (group 3) were significantly higher than for the 2 internal/1 external cells (group 2). It appears that just one piece of internal or external information cannot greatly reduce the effect of two other pieces of opposing attributional information. Results for feedback affect followed the same pattern, but were not significant (because of large within-group variance). The behavioral intentions results indicate that providing three pieces of internal information discourages intended effort: the value for intended effort was significantly lower when all three pieces of information were internal. In short, ratings of feedback are more positive when it includes more external than internal attributional information.

DISCUSSION

The research this article reports has certain limitations. Variance accounted for in the dependent measures did not exceed 16 percent, and the experiment used students who were responding to hypothetical scenarios. However, a situation in which a professor gives feedback to a student is

TABLE 5
Results of One-Way Analyses of Variance for Combinations
of Internal and External Information

Dependent Variables	Means ^a				$F_{3,84}$	Eta^2	Variance Accounted for in Linear Component
	Group 1 3 internal (<i>n</i> = 11)	Group 2 2 internal/ 1 external (<i>n</i> = 33)	Group 3 2 external/ 1 internal (<i>n</i> = 33)	Group 4 3 external (<i>n</i> = 11)			
Feedback rating	-.264	-.120	.622	.719	4.25**	.13	.11
Group comparisons*: G3 and G4 > G1 and G2							
Feedback affect	-.276	-.118	.244	.469	1.45	.05	.05
Group comparisons*: None significant							
Behavioral intentions	-1.273	-.025	.156	-.228	5.42**	.16	.06
Group comparisons*: G2, G3, and G4 > G1							

^aDependent variables were standardized within each school.

**p* < .05

***p* < .01

realistic from a student's perspective. We felt it was preferable to use students who were role playing, than to actually manipulate failure, which would pose various ethical problems.

A second problem for external validity is the use of a teacher-student dyad. Although much of the attributional research has employed students as subjects (Kelley & Michela, 1980), there is some question as to whether of such research are generalizable to manager-subordinate relationships. Teacher-student and manager-subordinate relationships (and others, such as parent-child and police officer-citizen) are similar in that they all involve feedback providers who have greater authority and status than the feedback recipients. Despite this similarity between the relationship we studied and others, it will clearly take further work to generalize the findings of this study across tasks, settings, and people. In addition, feedback provided in this study came from only one source, the superior. Research has indicated that individuals may see other sources — e.g., self and task — as providing information (Greller & Herold, 1975). Future research should consider these other sources of causal feedback.

Within this study's limits, the results clearly show that individuals rate specific feedback, operationalized as information pertaining to the feedback recipient's past performance and the performance of peers, more positively than they rate nonspecific feedback. As predicted, people assessed feedback including consistency, distinctiveness, and consensus information more favorably than feedback containing no information on these dimensions. Past research that has found specific feedback to be rated more positively than nonspecific feedback has focused on feedback pertaining to the task itself (Ilgen et al., 1981a, 1981b). Thus, the suggestion made by Ilgen, Fisher, and Taylor (1979) that misperceptions and nonacceptance of negative feedback might be corrected by providing more specific feedback seems to apply both to feedback concerning tasks themselves and to feedback providing information from which causal inferences can be made. The feedback provider who gives feedback containing such information evaluates the recipient's current performance in the context of that person's past performance on the task in question and on other tasks; the provider also gauges how the person's performance compares with the performance of peers. Such relative, referent information may give the feedback provider evidence that better supports negative feedback and also evokes greater acceptance of this feedback by the recipient than occurs when feedback lacks relative, referent information.

Also as predicted, subjects rated feedback that suggested external causes more positively than they rated specific feedback suggesting internal causes. Although past studies have indicated that individuals view positive feedback more favorably than negative feedback (Ilgen et al., 1979), feedback in all conditions of the present investigation was negative. In all cases subjects were told to react as if they had received a D on an exam. However, we manipulated this negative feedback so that it varied as to the pattern of performance it implied by varying consistency, consensus, and distinctiveness information. Thus, our results indicate that, just as individuals are more

likely to accept positive feedback than negative feedback, they also react more positively to negative feedback that seems to be an isolated event attributable to external causes than to a consistent pattern of failure.

Contrary to prediction, our results also suggest that individuals do not prefer specific feedback implying internal causes to nonspecific feedback. Planned comparisons revealed no significant differences between ratings of specific feedback implying internal causes and ratings of nonspecific feedback. Subjects rated ambiguous information and unfavorable information implying internal causes about the same.

An interesting result emerged with respect to behavioral intentions. Ratings of intended effort in studying for the final examination were significantly lower for subjects receiving three pieces of internal information than for subjects receiving any other combination of information. Perhaps three internal information items simply make individuals give up. That is, when students are told that they have done poorly on other tests and failed the term paper, while everyone else has done well, the reaction may well be, "I just don't have it in this area, why should I try?" Although we cannot, on the basis of results of a single study, suggest that the threshold for significantly lower behavioral intentions is three pieces of internal information, it is an issue worthy of more research.

One disappointing aspect of the findings on behavioral intentions was that specificity of feedback did not influence subjects' intended effort in studying for the final examination. However, similar results have been found in other studies. For example, Ilgen and his colleagues (1981a) did not find a significant relationship between type of negative feedback and subsequent behavior. Research on the related topic of reward and punishment has (with few exceptions, such as Greene, 1976) found leaders' performance-contingent (and noncontingent) punishment of subordinates to be unrelated (Podsakoff, Todor, & Skov, 1982; Sims, 1977) or negatively related (Sims & Szilagyi, 1975) to subsequent employee performance. Despite these rather discouraging findings, it appears that the type of negative feedback provided has important implications. For example, in the current investigation, subjects rated specific feedback more positively than nonspecific feedback and also reported more positive affect (toward both feedback and professor) when feedback was specific rather than nonspecific. Similarly, in the study by Ilgen and his colleagues, "when feedback was specific, the quality of supervision and the expertise of the supervisor were rated as significantly higher" (1981a: 407). Thus, although immediate changes in behavior may not occur, more positive reactions to a superior's feedback appear to influence the feedback recipient's respect and liking for the superior. For example, in the context of the current investigation, students who rated the professor's feedback more favorably might be more inclined to concentrate on lectures, and to ask the professor questions after class than students who rated the feedback less favorably.

Although only further tests can verify these hypotheses, it is clear from the current study that feedback including teachers' judgments about the

causes of a performance problem can influence a variety of student reactions. Such findings broaden the conceptualization of feedback specificity that Ilgen, Fisher, and Taylor (1979) suggested, and open a number of questions for further research.

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STUDYING INTERPERSONAL COMMUNICATION IN ORGANIZATIONS: A LEADERSHIP APPLICATION

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Five content- and behavior-oriented scales were developed to measure interpersonal communication between supervisors and subordinates. The relationship between the five scales and two leadership dimensions, initiating structure and showing consideration, was then evaluated. The results emphasize the need to focus attention on leaders' communication, including their relational messages.

Recently Schuler (1979) took a major step forward in the area of research on organizational communication with his role-perception transaction-process model of organization communication, which describes the relationship among communication, role perceptions, and two outcome variables — satisfaction and performance. The model is important both because (1) it integrates communication with a widely known and researched model of organizational behavior (House & Rizzo, 1972; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964) and (2) it develops a theoretical basis upon which organizational communication can be related to certain aspects of organizational behavior.

Despite the model's importance, it is only one step towards meeting a need identified by Roberts, O'Reilly, Bretton, and Porter (1974) for (1) specifying the dimensions of organizational communication and (2) integrating the various aspects of organizational behavior with communication in organizations. Schuler's (1979) model contributes to both these ends; however, its focus is on one area of organizational behavior—role perceptions.

The purpose of this paper is to extend organizational communication research in the direction identified by Roberts et al. (1974) by specifying certain dimensions of organizational communication and by investigating the relationship between communication and leadership. More specifically, our twofold purpose includes, first, to develop measures of commonly accepted content-oriented dimensions of organizational communication

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suiting to measuring interpersonal communication behaviors between supervisors and subordinates. The second purpose of this paper is to describe the interpersonal communication behavior between supervisor and subordinate that subordinates associate with leadership style. Thus, the paper both specifies dimensions of communication and begins to integrate organizational communication with another area of organizational behavior — leadership.

MEASUREMENT OF ORGANIZATIONAL COMMUNICATION

Measuring interpersonal communication in organizations is difficult because of the nature of communication. Communication is a process, it is transactional, and its relationship to other organizational variables may be characterized by reciprocal causality (Schuler, 1979).

Directionality and formality of information are the dimensions of communication most often measured in the organizational communication literature (Marett, Hage, & Aiken, 1975; Roberts & O'Reilly, 1974). Researchers have paid little attention to the content of communication or to the communication behavior of employees of organizations, focusing instead on the structure of communication and on attitudinal outcomes, such as satisfaction.

When Roberts and O'Reilly (1974) developed their measurement instrument for organizational communication, they observed that they discarded items related to communication content because of the difficulty respondents had in answering them. In his replication study, Muchinsky (1977), having observed that there still was a need to develop measures of the purpose and content of communication, went on to note that all upward communication is not the same; upward communication varies in frequency as a function of the purpose or content of the communication. Focusing on purpose or content of communication makes the instrumental role of communication in organizations clearer (Alexander & Penley, 1981; Hawkins, Penley, & Peterson, 1981).

Several writers (Berlo, 1960; Greenbaum, 1974; Katz & Kahn, 1966; Redding, 1972) have suggested categorization systems for the content of communication within organizations. Most of these systems use the function of the communication as the basis for categorizing a message. For example, Redding's three classifications were task, maintenance, and human; Berlo used categories that he called production, innovation, and maintenance. More recently, Greenbaum identified four major communication networks: regulative, innovative, maintenance, and informative.

Greenbaum (1974) suggests that regulative messages include policy statements, procedures, and rules; innovative messages concern development and adaptation; maintenance or integrative messages include performance feedback such as praise from a supervisor and "informal scuttlebutt"; and informative messages seek to enhance productivity through providing subordinates with information about how to carry out their jobs.

Besides the content of communication, we would also like to measure communication behavior or, at least, perceptions of communication behavior,

rather than gestalt impressions of communication. Alexander and Penley (1981) observed that measures of communication behavior rather than of communication outcomes, such as formality, accuracy, and satisfaction, would better enhance our understanding of the relationship between communication and behavioral outcomes.

Communication and Leadership

Jablin's (1979) review of the literature on superior-subordinate communication shows that there has been no lack of attention to communication between leaders and subordinates. Interest in the communication behavior of leaders comes in part from the difficulty of defining behaviors associated with leadership. Researchers have tried to define leadership in a number of ways, including a behavioral approach (Davis & Luthans, 1979), an attributional approach (Calder, 1977), and an approach via the communication behavior of leaders (Pondy, 1976; Sims & Manz, 1980).

Much of the research concerning communication and leadership has focused primarily upon the communication behavior of the effective supervisor (Jablin, 1979) rather than upon communication as the observable behavior of leadership. Earlier, Redding (1972) summarized this research. He stated that effective supervisors (1) were more communication-oriented than the ineffective leader and enjoyed speaking up, (2) tended to be receptive and responsive to subordinate inquiries, (3) tended to ask or persuade rather than to tell, and (4) gave advance notice of changes and explained the why of things — that is, were more open.

Also, much of the recent research on leadership has focused on leaders' consideration and initiating structure, two dimensions of leadership behavior identified in the Ohio State University Studies (Stogdill, 1963). In his discussion of leader behavior and communication, Jablin (1979) observed that there was a close correspondence between showing consideration and communication, an observation also made by Redding (1972), by Jain (1973), and by Miraglia (1963), who found that communication ability correlated with showing consideration at a .89 level, but with initiating structure at only a .37 level.

The focus of previous research has been on consideration rather than on initiating structure, an understandable tendency, since consideration is operationalized in terms of an individual's interpersonal concern and emphasis on human relations, both of which have often been associated with communication behavior (Jablin, 1979).

The high degree of association between communication behavior and showing consideration may be somewhat misleading in that it may reflect only the relational aspects of communication that were captured both in previous measures of communication and in the measure of consideration. Watzlawick, Beavin, and Jackson (1967) suggest that there are two levels of communication: (1) the content level that is informational or topical, and (2) the relational level that defines role relationships among the communi-

cators. The content level corresponds to what is being said and the relational level to how it is said.

Certainly, showing consideration is more heavily laden with the relational level than is initiating structure, which reduces uncertainty through its dependence on the content level of communication. Of course, initiating structure can include relational aspects of communication as well. For example, the relative degrees of control and power that communicators have are certainly communicated as relational messages during initiating structure exchanges; however giving information — providing data, clarifying, and reducing uncertainty, all content-level communication behaviors — predominates.

Two studies (Bradley & Baird, 1977; Sims & Manz, 1980) of leaders' communication have focused on its content. In their study of managerial communication style, Bradley and Baird included two managerial behaviors that correspond loosely to showing consideration and initiating structure. They found that the managerial behavior of being "receptive to subordinates" — corresponding to showing consideration — correlated positively and significantly with a number of scaled communication items. The managerial behavior of "tells what to do" — corresponding to initiating structure — was significantly and positively associated with dominating conversations and other related communication items.

In their laboratory-based content analysis of messages, Sims and Manz (1981) found that the four most frequent messages of leaders were (1) task information statements, (2) utterances, (3) miscellaneous statements, and (4) task information requests. Two of the four seem to be more typical of initiating structure than of showing consideration. Sims and Manz concluded that task-oriented rather than persuasive messages were the basis of leaders' communication; thus, a leaders' communication behavior could best be classified as task- and information-oriented.

Although all leader behaviors could be considered communication behaviors, the communication literature has consistently considered showing consideration, in particular, as communication behavior. The specific content and purpose of leaders' communication behavior is still somewhat unclear, although Bradley and Baird (1977) as well as Sims and Manz (1980) have given some indication of its character.

In order to elucidate the characteristic communication behavior that is exhibited through initiating structure and consideration, we will report on two studies. Study 1, which elaborates the dimensions of interpersonal communication in organizations, extends organizational communication research by measuring the content of interpersonal communication between supervisor and subordinate with behaviorally focused scales. Study 2, which investigates communication behavior associated with the leadership styles of initiating structure and showing consideration, extends communication research by pursuing communication's relationship with other aspects of organizational behavior. Thus, this research addresses two questions:

Question 1: Are there identifiable dimensions of inter-

personal communication between supervisor and subordinate?

Question 2: What are the relationships between those dimensions and two aspects of leadership — initiating structure and showing consideration?

STUDY 1: METHODS

Subjects

Data were collected from the personnel and support services areas of a large southern insurance company, a division of the company having 600 employees, 25 percent of whom were randomly selected for participation in the study. Of the 150 randomly selected employees, 122 voluntarily participated in the study, for an 81 percent participation rate. Sixty-four percent of the subjects were not supervisors; approximately 50 percent had completed less than two years of college; 41 percent were members of minority groups; and 51 percent were females. The mean age was 38.

Subjects, who completed the questionnaire in a large auditorium on their firm's premises, were assured of anonymity and were promised that only summary data would be provided to management.

Study Variables

We used the message categorization systems proposed by Redding (1972) and Greenbaum (1974) to develop five a priori categories of supervisor-subordinate communication: (1) task communication, (2) performance communication, (3) career communication, (4) communication responsiveness, and (5) personal communication. We designed items emphasizing the content of these five aspects of communication and stated them in such a way that they highlighted communication behavior of supervisors and subordinates. Responses were measured on a 6-point Likert scale anchored by strongly disagree and strongly agree. The following discussion of the five categories measured includes illustrative items; a complete list of items is available from the authors.

Task communication included four items that measured the extent to which supervisors let subordinates know what needed to be done, explained changes in the workplace, and explained policy (e.g., "My supervisor lets us know about changes that are coming up."). Redding's (1972) task category and elements of the regulative and informative networks of Greenbaum's (1974) system were sources of these items.

Performance communication included three items that measured the extent to which supervisors communicated information about the quality of subordinates' work or how well they were doing (e.g., "My supervisor lets me know which areas of my performance are weak."). Such items represent the achievement-oriented aspect of Redding's (1972) maintenance category as well as the performance feedback described by Greenbaum (1974) as an element of the maintenance or integrative communication network.

Career communication included five items that measured the extent to which supervisors discussed training opportunities with subordinates and provided them with career advice (e.g., "My supervisor discusses with me how to get additional training."). Although Greenbaum (1974) mentions career communication as a possible communication policy, he does not directly identify it in his discussion of his four communication networks. Gould and Penley (1984) have demonstrated an association between aspects of career communication and salary progression that suggests the importance of career communication. It is clear that interpersonal communication between supervisors and subordinates that focuses on career encourages the latter's development and adaptation— aspects of Greenbaum's innovative communication network. We designed items to focus on communication about career as one way in which supervisors encourage innovation among subordinates.

Communication responsiveness included four items that measured the extent to which supervisors listened to subordinates and responded to issues raised by them (e.g., "When I ask a question, my supervisor does his/her best to get me an answer."). These items represent the human category identified by Redding (1972). They are explicitly associated with Redding's earlier (1968) paper in which he described feedback receptiveness as the degree to which supervisors are willing to listen and feedback responsiveness as the degree to which supervisors follow through and get employees answers when they ask questions.

Personal communication, the final supervisor-subordinate communication scale, included three items that measured the extent to which supervisors and subordinates discussed personal issues such as family and non-work related interests (e.g., "My supervisor asks about my interests outside work."). These items represent the "informal scuttlebutt" that Greenbaum (1974) described as maintenance or integrative messages.

The study also included 16 scales from the Roberts and O'Reilly (1974) communication questionnaire: trust, mobility, influence, accuracy, summarization, overload, underload, desirability of communication, gatekeeping, directionality-peers, directionality-supervisor, directionality-subordinates, written mode, face-to-face mode, telephone mode, and communication satisfaction. Finally, we obtained self-reported measures of gender, age, tenure, education, and ethnic background from the respondents.

Analysis

The five communication scales described previously were identified *a priori*, so we extracted a 5-factor solution from the 19 communication items in order to verify the *a priori* definitions. We chose an oblique factor rotation because of the relatively high intercorrelations among the five communication measures (see Table 2).

We computed scores for each of the five scales by summing the responses to items; we then correlated these scale scores with the scores of the scales from the Roberts and O'Reilly (1974) questionnaire in order to determine the extent to which the five communication scales created in this study made a

unique contribution to the measurement of interpersonal communication in organizations.

STUDY 1: RESULTS

Table 1 reports the factor loadings from the oblique rotation; they were generally high (above .50) for the appropriate factor and low (below .30) for other factors.

Table 2 reports intercorrelations and reliabilities of the five content-oriented communication scales for the study 1 sample; intercorrelations were relatively high, with two above .70. The values of Cronbach's coefficient alpha were within the acceptable range for all five measures; the lowest was for personal communication ($\alpha = .74$).

Table 3 reports correlations between the five content-oriented communication scales and the scales from Roberts and O'Reilly's (1974) questionnaire.

TABLE 1
Oblique Factor Pattern Matrix^a for Communication Behaviors
in the Study 1 Sample

Items	Responsiveness	Personal	Career	Performance	Task
1	.05	-.04	.18	.76	.03
2	.04	-.04	.14	.79	.01
3	.15	.11	.10	.74	.04
4	.10	.04	.18	.07	.64
5	.06	.02	.10	.03	.80
6	.33	-.01	-.01	.06	.45
7	.48	.01	-.05	.12	.31
8	.20	.05	.50	.27	.04
9	-.02	.06	.86	.04	.08
10	.02	.01	.91	.00	.07
11	.21	-.05	.52	.21	.03
12	-.02	-.02	.57	.28	.09
13	.08	.60	.08	.01	-.14
14	-.15	.66	-.15	.09	.10
15	.12	.90	.12	-.11	.12
16	.92	.05	-.02	.10	-.06
17	.67	-.04	.03	.16	.18
18	.69	.03	.14	.02	.13
19	.93	.00	.03	-.05	.05
Eigenvalue	10.05	2.00	1.67	.85	.72
% variance	52.90	10.51	8.80	4.50	3.80
Congruency coefficients ^b	.88	.89	.94	.86	.35

^aLoadings used to interpret factors are in boldface.

^bCoefficients were computed between the two independent sample matrices; they are explained in results for Study 2.

TABLE 2
Scale Inter correlations and Reliabilities^a
for the Study 1 Sample

Communication Behavior Categories	1	2	3	4	5
1. Task	(.87)				
2. Performance	.72	(.88)			
3. Career	.69	.77	(.92)		
4. Responsiveness	.80	.66	.62	(.95)	
5. Personal	.43	.43	.49	.41	(.74)

^aValues on the diagonal are Cronbach alphas.

TABLE 3
Correlations between the Five Categories
of Supervisory-Subordinate Communication Behaviors
and the Roberts and O'Reilly^a Measures
of Communications

Roberts and O'Reilly Measures	Five Categories of Communication Behaviors				
	Task	Performance	Career	Responsiveness	Personal
Trust	.62**	.66**	.70**	.79**	.34**
Mobility	.20*	.13	.06	.10	-.06
Influence	.36**	.49**	.42**	.34**	.08
Accuracy	.27**	.16*	.24**	.23**	.06
Summarization	.06	.05	.12	.03	-.01
Overload	.04	.14	.09	.10	.10
Underload	-.33**	-.29**	-.30**	-.32**	.12
Desirability of communication	.15*	.14	.18*	.21	.07
Gatekeeping	-.29**	-.26**	-.22**	-.33**	-.18*
Direction-peer	-.11	.05	-.09	-.01	-.14
Direction-supervisor	.07	.14	.05	.13	.07
Direction-subordinate	-.02	-.01	.04	-.04	-.05
Written mode	.00	-.10	-.06	-.07	-.13
Face-to-face mode	.14	.14	.15*	.08	.17*
Telephone mode	.08	.06	.19*	.07	.23**
Communication satisfaction	.15*	.24**	.22**	.21*	.05

^aRoberts & O'Reilly (1974).

* $p < .05$

** $p < .01$

Correlations were highest between the five content-oriented scales and two of Roberts and O'Reilly's noncommunication scales — trust and influence. Correlations were lower between the two sets of communication scales than among the noncommunication scales, but there were significant correlations between the two sets, with the strongest being that between underload and gatekeeping and the five scales we designed. As underload and gatekeeping both measure generalized, limited communication, the significant negative correlations were not surprising. Accuracy and communication satisfaction, which also represent generalized feelings about communication, were significantly and positively associated with all but personal communication.

STUDY 2: METHODS

Subjects

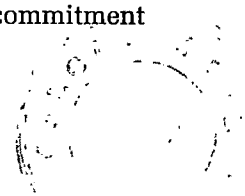
Data were collected from a logistics and support division of a large military base. We sent questionnaires to each of the 463 nonsupervisory workers in the division with an accompanying letter assuring them of confidentiality; we also assured them that only summary data would be provided to the military. Two-hundred seventy-one individuals voluntarily returned the confidential questionnaire via interdepartmental mail. After matching these individuals' questionnaires with those returned by their supervisors, also as volunteers, we had data for 207 subjects, given a final response rate of nearly 45 percent. The mean age of the subjects was 37; only 10 percent had completed college, although 58 percent had attended; 39 percent were members of minority groups, 26 percent were women. Almost one-half were in the military, and the rest were civilians.

Study Variables

The same five communication scales used in Study 1 were used in Study 2; namely, performance communication, task communication, career communication, communication responsiveness, and personal communication.

We used the items from Form XII of the Leader Behavior Description Questionnaire (Stogdill, 1963) to measure initiating structure and showing consideration. The items measured the extent to which subordinates perceived their supervisors to have provided structure (initiating structure) and to have behaved in a considerate manner.

We measured three outcome variables: job satisfaction, performance, and organizational commitment. Job satisfaction was measured with a modification of the scale developed by Brayfield and Rothe (1951) consisting of eight items in a 6-point response format similar to the one we used in measuring communication ($\alpha = .91$). Performance was measured by seven items completed by employees' supervisors that included measures of dependability, adaptability, cooperativeness, competence, initiative, interpersonal relationships, and overall performance; supervisors responded to each item on a 7-point scale ($\alpha = .94$). Finally, organizational commitment



was measured with a modified Hrebiniak and Alutto (1972) organizational commitment scale ($\alpha = .91$).

Analysis

Following the method of analysis used in Study 1, we factored the 19 communication items, rotating a five factor solution with a moderately oblique solution. To measure the stability of the factor structure across the two samples, we computed factor congruency coefficients (Harman, 1967) between the factors produced by the data in study 1 and the data in this second study.

We examined the relationship between supervisor-subordinate communication and the two measures of leadership by means of a multiple analysis of variance (MANOVA), with the five communication scales as the multiple dependent variables. We computed scores for each of the five scales by summing the responses to items included in each. Initiating structure and showing consideration were split at their medians in order for them to be used as the independent variables in a 2×2 MANOVA. Slightly less than half of the subjects fell into the low initiating structure group, and 50.5 percent fell into the high initiating structure group. Because of the distribution of the data, 41.2 percent of the subjects fell into the low consideration group and 58.8 percent fell into the high consideration group.

We computed structure correlations and Roy and Bargmann (1958) stepdown F s in order to determine the relative contribution of each of the five communication scales to overall differences among the four cells. The order of the communication scales for stepdown F s is personal communication, task communication, performance communication, communication responsiveness, and career communication. This order was chosen on the basis of our belief that each successive scale represents additional demands on the relationship between supervisor and subordinate — for instance, personal communication makes few demands whereas career communication depends upon an established and trusting relationship.

As our analyses of the relationship between communication and leadership depend upon the measures of initiating structure and sharing consideration, it seemed appropriate to check that the two measures were not behaving in an aberrant fashion. Thus, three 2×2 analyses of covariance were completed, with the two leadership measures as independent variables, the demographic variables that correlated with the outcome variables as covariates, and job satisfaction, performance and organizational commitment as dependent variables.

STUDY 2: RESULTS

Stability of Communication Scales

Table 1 reports the factor congruency coefficients that were computed between independent factor pattern matrices of the two samples. Factor congruency coefficients that are at or above the high 80's indicate congruence between factors from independent samples (Harman, 1967); all but one

of the congruency coefficients met this criterion. Items from the task communication scale loaded with items on communication responsiveness in the Study 2 data, indicating that the Study 2 data provided moderately strong support for the stability of the communication scales.

Leadership and Outcomes Variables

Table 4, reporting the relationships between initiating structure and showing consideration and the outcome variables of performance, satisfaction, and commitment, shows that there were significant main effects for consideration and initiating structure. Supervisors rated performance significantly higher for employees who reported a high level of consideration behavior from their supervisors than for employees who reported a low level. Satisfaction was higher for employees in the high initiating-structure group and in the high consideration group than for employees in the low groups. For the outcome variable — commitment — there was a significant main effect only for showing consideration: employees in the high consideration group reported greater organizational commitment than did those in the low consideration group.

These results, suggesting that respondents' perceptions of leadership were meaningfully related to such outcome variables as performance, satisfaction, and organizational commitment, should allow us to interpret subsequent inferences about relationships between communication and leadership more meaningfully than has been possible previously.

Leadership and Communication

There were significant and distinctly different associations between each of the leadership variables and the five aspects of supervisor-subordinate

TABLE 4
Results^a from ANCOVA of Performance,
Satisfaction, and Commitment by Leadership Variables

Source	Performance	Satisfaction	Commitment
Covariates			
Single	6.19*	—	—
Age	—	21.18**	—
Main effects			
Initiating structure (IS)	0.04	4.60*	0.31
Showing consideration (C)	6.44*	7.92**	4.73*
Interactions			
IS × C	0.02	0.25	1.07

^aValues of *F* obtained

**p* < .05

***p* < .01

communication. Table 5, which reports the results of the MANOVA, includes the two main effects of initiating structure and showing consideration as well as an effect that is due to interaction of the two variables. All three effects accounted for significant differences among the four groups defined by the possible combinations of high and low initiating structure and showing consideration. Wilks' lambda for the consideration effect was .60 ($p < .01$); for the initiating structure effect it was .66 ($p < .01$); and for the effect of the interaction, Wilks' lambda was .86 ($p < .01$).

Each of the communication variables was significantly associated with consideration: Table 5 reports significant univariate F -tests for all five aspects of supervisor-subordinate communication. In subsequent analyses, however, three of the five aspects of supervisor-subordinate communication appeared to account for the effect of consideration on the four groups, as the following structure correlations demonstrate. For communication responsiveness, the structure correlation was $-.88$; for task communication, it was $-.81$; and for career communication, $-.63$. All three of these communication variables had significant Roy and Bargmann stepdown F s, thereby corroborating the information provided by the structure correlations.

Although each of the univariate F s in Table 5 was significant for the initiating structure effect as well, two of the five communication variables are of primary importance: task communication and performance communication, with the structure correlations of $r = -.88$ and $r = -.86$, respectively. The Roy and Bargmann stepdown F s were significant for both of these variables as well.

For the interaction effect in Table 5, there was one significant univariate F —for career communication; however, there were two significant Roy and Bargmann stepdown F s: for performance communication ($F = 7.6, p < .01$) and career communication ($F = 7.9, p < .01$). Both of these communication variables were associated with the two highest structure correlations, although the structure correlation for career communication ($r = .51$) was twice as large as the absolute value of the structure correlation for performance communication ($r = -.25$), thereby corroborating the importance of the career communication variable.

DISCUSSION

The results of the two studies embody the suggestions of Muchinsky (1977) and of Alexander and Penley (1981), in that the communication scales measured perceptions of communication behavior rather than communication outcomes or gestalts of feelings about communication. The scales also identified several unique dimensions of supervisor-subordinate communication, as was called for by Roberts et al. (1974).

Those unique dimensions were intercorrelated to a moderately high degree. Although the scales represented conceptually distinct dimensions, the relatively high degree of collinearity in the data limits the extent to which we can claim that independent dimensions of the supervisor-subordinate content-oriented communication are measurable, a limitation

TABLE 5
Results from MANOVA Analyses of the Relationship
between Leadership Variables and Five Communication Behaviors

Communication Behaviors	Cell Means								Showing Consideration				Initiating Structure				Interaction			
	Low IS ^a		Low C ^b		High IS		High C		Univariate F	Step-down F	Structure correlation	Univariate F	Step-down F	Structure correlation	Univariate F	Step-down F	Structure correlation			
	X̄	σ	X̄	σ	X̄	σ	X̄	σ												
Task	3.4	1.0	4.6	0.6	3.6	0.9	5.0	0.6	85.3**	51.1**	-.81	78.5**	50.1**	-.88	0.7	0.3	.15			
Performance	3.1	1.2	4.2	0.9	4.1	1.3	4.8	0.7	33.2**	0.5	-.51	75.0**	8.2**	-.86	1.9	7.6**	-.25			
Career	2.8	1.1	3.6	1.1	2.6	1.1	4.5	1.0	51.8**	5.3*	-.63	58.0**	1.2	-.76	7.9**	20.0**	.51			
Responsiveness	3.7	1.1	5.0	0.3	3.7	1.1	5.2	0.6	100.4**	17.9**	-.88	57.0**	2.1	-.75	0.4	0.1	.11			
Personal	3.0	1.2	3.9	1.1	3.0	1.4	4.3	1.0	33.0**	33.0**	-.50	26.5**	26.5**	-.51	1.2	1.2	.20			
Wilks' lambda									.60**			.66**								

^aIS = Initiating structure

^bC = Showing consideration

* $p < .05$

** $p < .01$

no doubt related to the difficulty Roberts and O'Reilly (1974) described in their earlier attempt to develop such content-oriented scales. Further research is necessary in order to explore this issue.

While the five content-oriented scales were not entirely unique, they did not duplicate the Roberts and O'Reilly (1974) measures. Shared common variance was substantially less than 10 percent in most cases; thus, these results, along with the stability of the factor structures, provided some evidence for limited construct validity.

There was greater shared variance between the five content-oriented communication scales and the noncommunication measures of influence and trust than there was between the five scales and the communication items of the Roberts and O'Reilly (1974) questionnaire. Such shared variance between these two types of measures may indicate something of what the content-oriented communication scales measure — that is, they may well measure relational messages as well as content.

Individuals may be unable to describe the content level of communication without also describing the relational level. Watzlawick, Beavin, and Jackson (1967), as well as others (Carson, 1966; Wiener & Mahrabian, 1968), state that we interpret and assign meaning not only to what is said, but to how it is said; meaning is not necessarily differentiated into content and relational levels. Instead, what is communicated between supervisor and subordinate is intimately tied to how it is communicated.

That content and relational messages are interrelated has important implications for the remaining results presented in this paper. They must be considered in light of the particular organization and in terms of the relationship between particular supervisors and subordinates. This does not mean that generalizations about leadership and communication behavior cannot be made, but it does mean that such generalizations must be understood as a part of the context of the organization from which data were gathered. We cannot presume that certain patterns of behavior will produce consistent, stable reactions in subordinates, regardless of the situation.

In the logistics and support division of the military base, supervisors who were perceived as showing consideration were also perceived as being more responsive, as communicating more task messages, and as communicating more career messages than other supervisors. Communication responsiveness and task communication were, among our communication dimensions, the most characteristic of showing consideration. Relational messages, such as responding to requests, taking the time to listen to subordinates, and answering questions, were also characteristic of showing consideration. Giving task-related messages, such as explaining policy changes, letting people know what work needed to be done, and discussing handling work-related problems with subordinates, was characteristic of leaders perceived to show consideration as well.

This last-mentioned, somewhat surprising finding could be interpreted as unique to this organization. Certainly, relational messages that are typical of communication responsiveness would be expected to be associated with

showing consideration, but task-related messages would be expected to be more typical of initiating structure. Perhaps supervisors show consideration for their subordinates not only by being approachable (listening and getting responses), but also by clarifying ambiguous situations through task communication. Interpreted in this manner, the association between task communication and showing consideration is consistent with path goal theory, which states that directive behavior by leaders will positively affect subordinate satisfaction in situations involving ambiguous tasks (House, 1971).

Supervisors who were perceived to initiate structure were also perceived to clarify policy, to let employees know what work needed to be done, and to discuss handling work-related problems with employees, all examples of task communication. They also let employees know which areas of their performance were weak, told employees how they could do better, and let employees know about the quality of their work — examples of performance communication.

Respondents who reported that their supervisors were high in showing consideration as well as in initiating structure also reported the highest level of career communication in the sample. There was little difference in the degree of career communication reported for supervisors who were perceived to be high in initiating structure but low in showing consideration and those supervisors who were perceived to be low in both showing consideration and initiating structure.

Supervisors who communicated career encouragement, discussed training opportunities, and offered career advice were perceived as both providing structure and showing consideration. Career-related messages no doubt reduce uncertainty for employees: they provide structure, and apparently also convey relational messages. Supervisors who were perceived to initiate structure and show consideration not only communicated valued informational messages, but also messages of concern, or positive relational messages.

The performance-communication interaction we found contrasts with the career-communication interaction. Subordinates who reported their supervisors to be high in both showing consideration and initiating structure reported higher performance communication than did other subordinates. However, subordinates who reported high consideration and low initiating structure, and those who reported low consideration but high initiating structure, reported about the same degree of performance communication. Only those subordinates who reported their supervisors to be low in showing consideration as well as in initiating structure reported a lower degree of performance communication than other subordinates. Supervisors who were perceived as initiating less structure and showing less consideration were perceived to communicate less about the quality of work, to communicate less about how to do better in work, and to provide less information about weaknesses in performance than other supervisors.

A supervisor's communication behavior allows the subordinate to attribute certain leadership qualities, such as showing consideration or initiating structure, to him or her. Following Heider's (1958) theory of attribution, we

may very well assume that the relationship between communication and leadership is one of attribution of leadership qualities to a supervisor; an environmental event, communication behavior is a basis for subordinates' attributions of leadership characteristics to their supervisors.

This paper contributes one description of supervisor-subordinate communications that is characteristic of attributed leadership qualities. Subordinates perceive that supervisors who show consideration communicate more task and career messages and are more responsive in their communication. Thus, showing consideration may imply communicating relational messages to subordinates; however, the sole communication of positive relational affect may be important but insufficient, since task communication was strongly associated with showing consideration as well.

Subordinates attribute the leadership characteristic of initiating structure to supervisors who communicate more performance-related and task-related messages. Subordinates attribute a high degree of both showing consideration and initiating structure to those supervisors whom they perceive as communicating more career-related messages than other supervisors, and they attribute a low degree of both showing consideration and initiating structure to those who communicate substantially fewer performance messages than other supervisors.

CONCLUSIONS

Interpersonal communication between supervisor and subordinate is both relational and content-oriented. Although supervisors may consider their primary communication goals as informational or content-oriented, it is clear that relational messages are also important. Clearly, perceived consideration behavior of the leader is associated with the relational level of communication; however, even the leadership function of reducing uncertainty via initiating structure is associated with the relational level of communication. Of course, the relational level of communication, characterized by communication responsiveness, is of less importance in distinguishing high initiators of structure from low initiators of structure than is the content level of communication.

This study extends the organizational communication literature by measuring five content-oriented and behavior-oriented dimensions of supervisor-subordinate interpersonal communication. Although this paper is not a validity study, its results do offer limited support for the construct validity of the scales that measure the five dimensions of communication. The paper also extends the organizational communication literature by integrating communication with an important aspect of organizational behavior—leadership. Furthermore, results suggest that the relationship between communication and leadership is not a simple one. Like the recent study by Fulk and Wendler (1982), this study, through examining multiple dimensions of communication, points to the multiple dimensions of leader behavior, and it emphasizes the equivocality of a two dimensional model of leadership.

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MEN'S AND WOMEN'S NETWORKS: A STUDY OF INTERACTION PATTERNS AND INFLUENCE IN AN ORGANIZATION

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This study investigated the interaction patterns of men and women in an organization and the relationship of these patterns to (1) perceptions of influence, and (2) promotions to supervisory positions. Results indicated that individuals' positions in workflow and interaction networks relate strongly to measures of influence. Although women were rated as less influential than men, the two groups showed no difference on many measures. However, women were not well-integrated into men's networks including the organization's dominant coalition, and vice versa. Women whose immediate workgroups included both men and women were exceptions. A follow-up indicated that promotions were significantly related to centrality in departmental, men's, and dominant-coalition interaction networks.

Despite an increased awareness of women's concerns, and an associated effort by corporations to hire and promote women, studies still suggest that women have not acquired status and influence comparable to that of their male counterparts in organizations (Hendrick, 1982; Missirian, 1982; Stewart & Gudykunst, 1982). Although researchers have offered several explanations for this disparity, a growing body of evidence indicates that there are few, if any, significant differences in the behavior of men and women in organizations (Bartol, 1978; Rice, Instone, & Adams, 1984; Terborg, 1977). One explanation that has yet to receive much empirical attention is the suggestion that women do not have equal access to informal interactions and communications (Bartol, 1978; Hendrick, 1981; Kanter, 1977). Women may be excluded from, or may exclude themselves from "one of the most significant components of successful power acquisition—the development of informal/influence relationships" (Schein, 1978: 265).

The present study investigated the interaction patterns of men and women in an organization and the relationship of such patterns to perceptions of influence and promotions. The importance of acquiring influence in an organization has been well-documented. Many have equated it with the ability to get things done (Kanter, 1979; Salancik & Pfeffer, 1977), and it is often associated with career success and upward mobility. Thus, an understanding of the factors that affect perceptions of influence in an organization is essential for both men and women.

INFORMAL INTERACTION PATTERNS

Several rationales have been presented as to why women do not benefit from informal interactions to the degree that their male colleagues do. One line of thought is that women, as relative newcomers in organizations, are not as aware of informal networks or as adept at building them as men are. For example, research has indicated that women do not differentiate formal from informal organizational structures as well as men do (Reif, Newstrom, & Monczka, 1975), and that women tend to rely on formal structures (Hennig & Jardim, 1977).

Another rationale concerns ease of communication and preference for interacting with persons with similar attitudes, values, and experiences. Hendrick (1981) has suggested that organizations are in a transition time, when rules and procedures for building informal professional relationships between men and women have not yet been established. Thus, members of one gender may feel uncomfortable in informal settings populated mainly by members of the other and may prefer interactions with persons of their own gender. Kanter (1977) found that men managers felt uncomfortable communicating with women.

Finally, an alternative view suggests that men, as the typically dominant group in most business organizations, wish to maintain that dominance by intentionally excluding women from informal interactions. Women are excluded from the "club," or "old boys' network." Interviews with women in professions dominated by men have reflected a feeling of exclusion from social interactions (Albrecht, 1983).

Regardless of which of the above explanations is chosen, the available literature leads to the expectation that women will be less central than their male counterparts to the informal interaction networks in an organization. Thus, women may not receive the possibly valuable information, resources, or support that often comes with inclusion in such networks. Although little empirical evidence is available regarding the relationship between informal network position and influence, the importance of informal contacts has often been hypothesized in the power literature (Allen & Porter, 1983; Fombrun, 1983; Mechanic, 1962; Pfeffer, 1981). For example, Mechanic hypothesized that the power of relatively low-level members of an organization is a function of the extent to which they have access to information, persons, and instrumentalities.

Much of the reasoning summarized in the previous paragraphs has presumed domination of organizations by men and numerical imbalance between genders, with women as tokens (Fairhurst & Snavely, 1983a; Kanter, 1977). Recent evidence (Fairhurst & Snavely, 1983b) has cast some doubt on the numerical imbalance hypothesis, and the current sample is approximately balanced at the nonsupervisory level. Thus, a woman may be highly central within an all-female subunit, or she may be as central as her male counterpart in the entire organization, and yet neither the man nor the woman might interact with those of the other gender. Thus, this study assessed employees'

centrality within a subunit, department, and the entire organization, as well as centrality within all-male and all-female interaction networks. This study explored the extent to which women were integrated into men's networks, and vice versa, and the extent to which integration into such networks related to perceived influence.

Access to Influential Others

Although the units of reference cited in the preceding paragraph do not differentiate among hierarchical levels, it is likely that being part of informal interaction networks of supervisors and top executives will be more instrumental to acquiring influence than being part of nonsupervisory networks. Of particular interest is the dominant coalition in an organization, those individuals who typically occupy the highest levels and who have the most influence and decision-making authority. Because men have historically dominated high-level hierarchical positions, women are less likely than men to be included in these informal, high-level interactions.

Workflow Position

Kanter (1979) has argued that the position, not the person, determines influence in an organization. For example, she has noted that women do not occupy critical or high-uncertainty positions within the workflow, but instead have routine, highly standardized jobs (Kanter, 1977) that require little discretionary decision making and have little visibility. Thus, it may be difficult for them to acquire influence through coping with critical organizational uncertainties.

Although the primary focus of the present study is on informal interaction patterns, it includes formal workflow positions to deal with the notion that power builds upon itself (Pfeffer, 1981). Employees who are not central or critical to an organization's workflow may find it difficult to become central to informal interaction networks. This may in turn inhibit their ability to develop alternate sources for acquiring inputs or distributing outputs needed for task performance. Thus, it is important to assess the possible interactions and overlaps between centrality, criticality, and transaction alternatives in the workflow, and positions in informal interaction networks.

Proximity

An employee's formal workflow position in an organization assumes even greater importance in light of the effects of proximity and required workflow interactions. Employees tend to develop informal relationships with others who work close to them. Therefore, the composition of immediate workgroups may be important. When workgroups contain both men and women, members are more likely to interact with those of the other gender, both formally and informally. Thus, if inclusion in men's networks is an important determinant of influence, women in such integrated workgroups will have more opportunity for interaction with men and inclusion in their networks.

In addition, this research attempts to identify informal interactions from those that go beyond the proximal workgroup and required workflow interactions. If women are less likely to be aware of, or to build, informal networks, it is likely that women will have less contact with others who are not included in their immediate workgroups.

Additional Factors

In tests for differences between men and women in regard to network position and degree of influence, it is important to consider possible differences in tenure or performance, and the relationship between membership in a particular department and influence. Perrow noted that "tasks are divided up between a few major departments or subunits, and all of these subunits are not likely to be equally powerful" (1970: 59). Empirical studies of power at the departmental level have supported this proposition (Hinings, Hickson, Pennings, & Schneck, 1974; Salanick & Pfeffer, 1974). Thus, employees may acquire influence simply by being members of a particularly powerful department.

Finally, it is possible that any differences between men and women in perceived influence may simply be due to stereotypes or perceptions that women are less influential than men. Thus, it is important to assess whether gender accounts for differences in perceived influence that the network measures cannot explain.

METHODS

Participants

This research was part of a larger study at a newspaper publishing company. One hundred forty full-time, nonsupervisory employees completed a questionnaire administered by the researcher; the response rate was 87.5 percent. The sample included 76 men and 64 women. The immediate supervisors of these employees completed a different questionnaire. Although no women occupied hierarchical positions above first-level supervisor, approximately 40 percent of the first-level supervisors were women, and they participated in rating the nonsupervisory employees. In addition, the publisher of the newspaper insisted that employees not be asked to fill out questionnaires that he and other top-level managers were not willing to complete. Thus, 90 percent of the second, third, and fourth-level managers, including the publisher, completed the same questionnaire that the nonsupervisory employees completed. In all cases, participation was voluntary and respondents were assured that their responses would be confidential and used for research purposes only.

Measures

Networks. On the nonsupervisory questionnaire, respondents were asked to list the names of persons (1) who provided them with inputs to their jobs and to whom they distributed the outputs from their work; (2) with whom

they talked frequently about work related topics; and (3) whom they considered close friends. These listings provided the primary basis for three types of networks: workflow, communication, and friendship. These listings were used to determine whether each person listed reciprocated that choice, counting only those employees who filled out questionnaires when considering these reciprocation rates. For the communication and friendship networks, this included the top-level managers who completed the nonsupervisory questionnaire.

For the workflow network, 84 percent of the employee listings were reciprocated. To supplement these listings, the workflow network was assessed with direct observation and interviews conducted before administering the questionnaire. This independently derived assessment of the workflow network was compared with the information generated by the employee listings. All discrepancies between the two workflow networks were resolved through interviews following the questionnaire.

For the communication network, 76 percent of the listings were reciprocated. A small sample of employees were interviewed after the questionnaire administration about discrepancies in the listings. In almost all cases, interviewees said they talked frequently with many people and had simply forgotten to list a particular person. An assessment of the friendship network listings indicated an 87 percent reciprocation rate. On the basis of the high degree of reciprocation and the sample interviews, all employee listings were considered when constructing the communication and friendship networks.

The corresponding communication and friendship network measures were averaged to form measures of informal interaction. This was done because of the high correlations — ranging from .60 to .97 — between similar measures across the two networks. Analyses for degree of influence produced virtually identical results whether the measures of communication and friendship networks were treated separately or combined.

Centrality. Several different measures of centrality were calculated for the sample of 140 nonsupervisory employees; each centrality measure refers to certain networks and groups of employees. Measures include centrality within the entire organization, within a department in which a focal person was a member, and within a subunit in which a focal person worked. Departments corresponded to the organization's formal designations; a subunit included all employees with the same immediate supervisor. Centrality indices based upon these three reference groups were calculated for the workflow network and the interaction network.

In addition to these six centrality measures, all men in the organization were considered the reference group for centrality scores for the men's interaction network; similarly, all women were the reference group for the women's network centrality scores. Thus, each employee received two additional centrality scores.

The final centrality measure was based on a focal employee's relationship to a small group of top-level personnel identified as the dominant

coalition. The dominant coalition was identified by considering the communication and friendship listings of the ten persons in the organization who were most often named as influential on the nonsupervisory questionnaire. Of these ten individuals, four were selected as representing the dominant coalition on the basis of their interaction patterns. Communication network listings were reciprocated by all four, and friendship network listings were reciprocated by three of the four; the friendship listings of one individual were reciprocated by only two of the other three persons. Nonsupervisors gave one of these individuals an overwhelming number of influence listings and ranked the other three in the top five. Therefore, these four persons were used as a reference group for calculating the centrality measure relative to the dominant coalition.

Following Blau and Alba (1982), centrality was defined operationally as the minimum distance between a focal person and all other persons in the pertinent reference group. The distance was measured by counting the number of links between a focal person and each other person; the resulting total was the centrality score, which was then divided by $n-1$, where n equalled the number of persons in the reference group. Finally, these average centrality measures were reversed so that high means reflect greater centrality than low means.

The resulting centrality measures are best interpreted in terms of ease of access to others in the reference group.¹ The measures reflect both direct relationships to others and indirect relationships mediated by those direct contacts. Thus, a person with a high centrality index has easy access to others. Such a person can be considered as central or well-integrated into a particular reference group.

Contacts with others. Because proximity and formally required interaction may have a major effect upon informal interaction patterns, a separate measure of contacts with others was calculated. This was done by counting the number of direct relationships with persons who were not members of a focal person's immediate workgroup or persons with whom a focal had to interact to perform normal work functions. This measure reflects the extent to which employees develop relationships with persons with whom they would not normally come into contact during required job performance.

Criticality. An index of criticality in the workflow was formed by counting the number of alternative routes through which work might flow if a focal person were removed from the workflow network: the greater the number of routes, the lower the criticality of the focal position. This measure reflects the extent to which a focal person controls the workflow — the extent to which the organization depends on that particular person for the continued flow of work through the organization. These scores were transformed so that a high score reflects high criticality.

Transaction alternatives. An index of transaction alternatives was formed by calculating the number of workflow positions available to a focal person

¹ See Freeman (1979) for a more thorough discussion of centrality measures.

for acquiring certain inputs or distributing certain outputs. This number was then divided by the total number of input/output links in order to obtain an average score for each focal person. This measure reflects the extent to which focal individuals have choices in regard to interdependencies that performing their tasks might require.

Performance. Measures of employee performance were obtained by having immediate supervisors rate the effort, quality, and quantity of performance of each of their employees. Only the first-level supervisors filled out this questionnaire. High intercorrelations between the three items (Spearman-Brown reliability = .87) warranted combining the items to form an average index of performance for each of the nonsupervisory personnel.

Tenure. A measure of tenure was obtained by asking employees to indicate the length of time they had worked on their jobs. These scores appear in terms of months.

Department. Respondents were assigned a score for each of the five formally designated departments: 1 = member, 0 = not a member. The five departments were editorial, business office, advertising, circulation, and production.

Integrated workgroup. Employees were assigned a score of 1 if the members of their immediate subunit were all of the same gender or 2 if the subunit included both men and women.

Table 1 presents the means, standard deviations, and intercorrelations for all the measures mentioned thus far in this section. Centrality measures for the men's and women's networks were highly correlated with centrality within the entire organization, as was expected, since the two groups represented subsets of the entire organization. Further analyses warranted their treatment as separate measures.

Influence. Two independent measures of influence were obtained. Nonsupervisors were asked to list the names of persons "whom you consider to be influential at the newspaper. That is, list persons who seem to have pull, weight, or clout in this company. List as many or as few as you think necessary." The mean number of nominations received by nonsupervisors was 1.37 (s.d. = 1.85).

In addition, the immediate supervisor of each employee was asked to rate that employee on a scale from 1 (very little amount of influence) to 7 (very great amount of influence). The instructions were the same as those noted above, with modifications appropriate to a rating rather a listing of names. The mean score was 2.80 (s.d. = 1.49). The correlation between number of nominations received from nonsupervisors and supervisors' ratings of influence was .70 ($p < .01$), indicating a significant degree of agreement between supervisors and nonsupervisors.

These immediate, first-level supervisors were not asked to list communication or friendship interactions to avoid the possibility of method-variance contamination of their influence ratings. However, ratings of influence and performance came from the same source.

TABLE 1
Means, Standard Deviations, and Intercorrelations^a of Predictor Variable

Measures	Mean	s.d.	1a	1b	1c	1d	1e	1f	2	3a	3b	3c	4	5	6	7
Interaction network																
1. Centrality	2.89	0.77														
a. Subunit	2.32	0.70	62													
b. Department	1.49	0.39	55	66												
c. Organization	1.42	0.41	57	55	82											
d. Men's network	1.60	0.58	34	53	82	34										
e. Women's network																
f. Dominant coalition	2.21	0.65	-08	15	10	26	-10									
2. Contacts with others	1.64	1.55	24	37	48	46	33	18								
Workflow network																
3. Centrality	3.39	0.44	09	26	01	10	-08	19	17							
a. Subunit	2.54	0.97	27	-13	04	21	-14	07	12	13						
b. Department	1.93	0.71	39	35	02	18	-15	02	-28	-29	27					
c. Organization	3.91	3.49	21	43	12	16	03	18	38	30	05	-44				
4. Criticality																
5. Transaction alternatives	3.85	2.46	-06	10	01	-01	01	19	05	-06	18	03	04			
Additional measures																
6. Integrated workgroup	1.37	0.49	32	40	17	25	03	12	32	14	-24	-28	49	-22		
7. Performance	5.22	1.13	21	27	32	23	29	20	15	-08	-02	-04	09	11	09	
8. Tenure ^b	78.74	85.76	-30	-27	-26	-13	-28	22	-19	00	-06	30	-07	09	-08	01

^a Decimals omitted; $p < .05$ for all $r > .17$; $p < .01$ for all $r > .22$.

^b Scores are in terms of months.

RESULTS

Table 2 presents a comparison of means for men and women on the measures of influence and all the predictor variables. Both supervisors and nonsupervisors perceived men as significantly more influential than women. However, the results indicate no differences between men and women on 9 of the 15 predictor variables.

In the differences that emerged, women in this sample were more central than men to both the workflow and interaction networks when the entire organization was the reference group. Because of the large number of women in the organization — approximately 40 percent — it was possible that men and women might be equally central, but in different networks that were

TABLE 2
Comparison of Means for Men and Women
on Measures of Influence and Predictor Variables

Measures	Men (<i>n</i> = 76)	Women (<i>n</i> = 64)	
Influence			
Supervisors' ratings	3.34	2.16	5.12**
Nonsupervisors' listings	1.74	0.94	2.60**
Interaction network			
Centrality			
Subunit	2.89	2.90	0.11
Department	2.29	2.36	0.62
Organization	1.39	1.61	3.41**
Men's network	1.49	1.33	2.45*
Women's network	1.26	2.01	10.20**
Dominant coalition	2.40	1.99	3.93**
Contacts with others	1.60	1.70	0.37
Workflow network			
Centrality			
Subunit	3.44	3.34	1.33
Department	2.44	2.66	1.29
Organization	1.87	2.13	2.93**
Criticality	4.53	3.56	1.64
Transaction alternatives	4.17	3.48	1.66
Additional measures			
Integrated workgroup	1.42	1.31	1.32
Performance	5.09	5.36	1.43
Tenure	93.66	61.03	2.28*

**p* < .05

***p* < .01

predominantly segregated. The data provided support for this notion. For the interaction network, men listed other men 75 percent of the time, and women listed other women 68 percent of the time. Thus, it appeared that two segregated networks existed.

The results regarding centrality in men's and women's networks were consistent with this conclusion: women were not as central as men within the interaction network composed of all men employees. The differences between men and women were even greater for centrality in the all-women interaction network. In addition, women were not as central as men in terms of informal interactions with the dominant coalition, a top-level group of four men.

Table 3 presents the zero-order correlations between the influence measures and the predictor variables both for the entire sample and for men and women separately. Both measures of influence yielded similar results, with many of the predictor variables showing significant relationships. Men differed from women on the variables of tenure, centrality within the departmental workflow network, and direct contacts with others outside the immediate workgroup. Criticality was particularly important for men, and integration into the dominant coalition was strongly related to influence for women.

Centrality in the men's interaction network was particularly important for women, but not significantly related to supervisors' ratings of influence for men. Centrality in the women's network was not significantly related to influence for the entire sample, but was significantly related to influence for men. Overall, the results support the notion that integration into social networks is strongly related to perceived influence.

Integrated Workgroups

The results in Table 3 also indicate a big difference between men and women based on membership in either an integrated or a segregated workgroup. As regards influence, it is very important for women to be members of integrated workgroups, as a series of *t*-tests showed. When compared with women in all-female workgroups, women in integrated workgroups scored significantly higher on the following measures: supervisors' ratings of influence; centrality in subunit and department interaction networks; access to the dominant coalition; contacts with others beyond the immediate workgroup; and centrality in the all-male network. Women in the integrated workgroups also had more critical positions than women in segregated workgroups.

When compared with men who were also members of integrated workgroups, these women were not significantly different from the men except on three measures in which the women scored significantly higher than the men ($p < .05$). These measures were centrality in the subunit, department, and women's interaction networks.

TABLE 3
Correlations between Influence Measures and Predictor Variables

Predictor Variables	Influence Measures					
	Supervisors' Ratings			Nonsupervisors' Listings		
	Entire Sample (<i>n</i> = 140)	Men (<i>n</i> = 76)	Women (<i>n</i> = 64)	Entire Sample (<i>n</i> = 140)	Men (<i>n</i> = 76)	Women (<i>n</i> = 64)
Interaction network						
Centrality						
Subunit	.15	.08	.34**	.14	.15	.15
Department ^a	.35**	.38**	.44**	.32**	.40**	.26*
Organization	.10	.24*	.25*	.19*	.33**	.18
Men's network	.28**	.13	.33**	.26**	.25*	.17
Women's network	-.10	.36**	.08	.06	.39**	.14
Dominant coalition	.47**	.26*	.58**	.39**	.29**	.43**
Contacts with others	.20*	.11	.38**	.12	.12	.14
Workflow network						
Centrality						
Subunit	.23**	.21	.22	.39**	.39**	.39**
Department	.14	.49**	-.21	.06	.32**	-.29*
Organization	-.08	.06	-.02	-.07	-.05	.03
Criticality	.52**	.63**	.39**	.36**	.40**	.28*
Transaction alternatives	.31**	.28*	.28*	.27**	.23*	.27*
Additional measures						
Department membership ^a	.46**	.42**	.41**	.26	.34*	.12
Integrated workgroup	.32**	.10	.56**	.17*	.13	.18
Performance	.16	.15	.33**	.09	.12	.13
Tenure	-.16	.00	.28*	-.10	-.08	.41**
Adjusted <i>R</i> ²	.57**	.54**	.64**	.35**	.33**	.32**

^a Department membership represents a multiple correlation.

**p* < .05

***p* < .01

Unique Contributions

In order to determine the unique contribution of each variable toward explaining variance in the influence measures, multiple regressions were obtained with all variables entered into the equation simultaneously. The significance of the beta indicated whether the independent variable significantly related to the dependent variable when all other independent variables were controlled. For the entire sample, criticality, transaction alternatives, and access to the dominant coalition had significant (*p* < .05) betas for both the supervisors' and nonsupervisors' measures of influence. In

addition, being a member of an integrated workgroup and centrality in departmental and organizational workflow networks also made significant unique contributions when the dependent variable was the supervisor's rating of influence.

For women, access to the dominant coalition and centrality in the men's interaction network were significantly related to both influence measures when all other variables were controlled. Performance was also significantly related to supervisors' rating of influence, as was centrality in the entire organization's interaction network. However, organizational centrality related negatively to the supervisors' ratings of influence when controlling for the other variables.

For men, the only variables with significant betas were criticality for the supervisors' ratings and centrality in the subunit workflow for the nonsupervisors' listings. However, centrality within the women's network approached significance ($p = .06$) for both dependent variables.

Table 3 reports the adjusted R^2 for each equation. This statistic, which adjusts for the number of independent variables in the equation and the number of cases, represents a conservative estimate of the total explained variance. When gender was entered into the regression equations following the entry of all other independent variables, it failed to make a significant contribution to the amount of variance explained in either of the dependent measures of influence.

Follow-up: Promotions

Company records indicated that ten employees in the original sample, seven of them men, were promoted to supervisory positions during the three years following the initial data collection. Although availability of positions and an organization's ability to promote from within constrain promotions, they provide some measure of employee success. Many have argued that building informal networks and acquiring influence are necessary to upward mobility. For example, Albrecht (1983) concluded that gender-segregated interaction patterns deny women access to information, resource allocation, and support that could aid their mobility within an organization. Despite the skewness of the distribution, which operates to limit the size of the correlations, being promoted correlated .34 ($p < .01$) with supervisors' ratings of influence and .43 ($p < .01$) with nonsupervisors' listings. Table 4 presents the correlations between promotion and the independent variables.

For the entire sample, being promoted was significantly related to centrality within the departmental, men's, and dominant coalition interaction networks. Subunit centrality and criticality in the workflow were also significantly related to promotion. Because only three women received promotions, separate analyses were not performed for men and women.

DISCUSSION

Overall, the results support the notion that informal interaction patterns are important to consider in assessments of influence and promotions in an

TABLE 4
Correlations of Promotion with Predictor Variables^a

Predictor Variables	<i>r</i>
Interaction network	
Centrality	
Subunit	.13
Department	.23**
Organization	.13
Mens' network	.22**
Womens' network	-.01
Dominant coalition	.28**
Contacts with others	.00
Workflow network	
Centrality	
Subunit	.22**
Department	-.10
Organization	-.01
Criticality	.21*
Transaction alternatives	.03
Additional measures	
Department membership ^b	.18
Integrated workgroup	.07
Performance	.13
Tenure	-.03
Adjusted R²	.22**

^a *n* = 140

^b Department membership represents a multiple correlation.

**p* < .05

***p* < .01

organization. The view that women are not aware of, or do not develop, informal networks in the workplace did not receive support. Rather, there were indications that women are more adept at building informal networks, especially with other women, than are men. In the organization as a whole, women were more central to the interaction network than were men.

These results may not be inconsistent with those that previously indicated that professional women were not well-integrated in informal networks (Albrecht, 1983). If these professional women were in professions largely dominated by men, numerical imbalance may have caused their exclusion from informal interactions. In the present sample, the number of men and women in the organization was approximately the same. Men and women appeared to build networks equally well, although each gender tended to interact with itself. Thus, there appeared to be two informal, segregated networks operating in the organization.

The result of this segregation was that women were less central to men's networks, in particular the interaction network of the dominant coalition. Access to this group of high-level men was very strongly related to influence for the women employees and was significantly related to promotions for the entire sample. Thus, both supervisors and nonsupervisors perceived women as less influential than men; in addition, women received disproportionately fewer promotions than men.

The exception to the rule of segregated networks appeared to be women who were members of integrated workgroups. These women were as central to the dominant coalition and the more general all-male network as the men in these same workgroups, and were also perceived as equally influential. Also, men in these integrated workgroups were more central in the women's network than men who were members of segregated workgroups. These findings emphasize the importance of proximity on informal interactions. However, the men in these integrated workgroups were still significantly less central to the women's network than women who were also members of integrated workgroups. Thus, although relative numbers of men and women in immediate workgroups is an important factor, it does not provide a complete explanation of these differences.

It is impossible to ascertain whether men actively exclude women from their informal interactions, and vice versa, or whether members of each gender exclude themselves from ties with members of the other gender. The predominance of direct links with members of the same gender is consistent with the findings Lincoln and Miller (1979) reported. They suggested that such homogeneity may improve ease of communication and predictability of behavior, a suggestion consistent with the notion that people prefer to interact with others whom they perceive to be similar to themselves. The results of the present study indicate that there may be constraints on this presumed preference—such as proximity, workgroup composition, numerical balance, and, as Fairhurst and Snavely (1983b) suggested, status.

In addition, gender is not the only basis of similarity. For example, individuals might see persons performing the same job function as more similar to themselves than persons of the same gender performing different jobs. Assuming that individuals in the same workgroup perform similar tasks, this explanation would also be consistent with the findings. In many organizations, differences in gender may be a surrogate for differences in job function, level in hierarchy, proximity, workgroup composition, numerical balance, and status. In such cases, one could hardly expect to find well-integrated informal interaction patterns.

The strong correlation between influence and access to the dominant coalition supports the popular notion of the importance of mentors (Kram, 1983; Missirian, 1982). Organizations can also attempt to integrate workgroups or to form task forces with balanced numbers of men and women. Encouraging women to form networks with other women in the same organization may be unnecessary, or, at worst, nonproductive. In terms of acquiring influence, the results of this research suggest that both men and women be

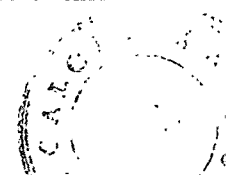
encouraged to build contacts with members of the other gender. In this study, those men who were more central to the women's network were also perceived as more influential than other men.

Several cautions are in order. This research represented only one organization, and the sample included only nonsupervisory personnel. Whether other organizations or a managerial population would yield similar results remains to be researched. To date, much more attention has been focused on women in management and leadership positions than on women in nonsupervisory positions. However, Mintzberg (1971) and Kotter (1982) noted the importance of communication and networks at the managerial level. Given that many promotions to managerial level positions come from inside the organization, studying nonsupervisory interaction patterns and promotions may provide some insight about emergent leadership. Longitudinal studies of these patterns and their relation to promotions and success following promotions are needed.

For the purpose of this investigation, informal interactions were assumed to be valuable sources of information, resources, and support that would in turn translate into influence and upward mobility in the organization. Although the results of this study establish a relationship between interaction and influence, they do not address this underlying assumption. Further research should deal with the specific content of interactions. This might be accomplished by means of unobtrusive observation at informal gathering spots like the lunch room or the coffee machine. Another method would be to identify influential employees by questionnaire or interview and then spend a day with each person recording the content and nature of interactions. In this way, it would also be possible to observe who instigates interactions. It might, for example, be that others seek out influential people much more often than the influential seek out the others. Employees may be more apt to exchange valuable information with persons whom they perceive to be influential. Thus, interaction and influence may build upon themselves, so that the influential become even more influential. The high amounts of variance explained by the interaction network measures in this study should encourage further research in this area.

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MANAGERIAL WORK BEHAVIOR: AN INTEGRATION OF RESULTS FROM TWO MAJOR APPROACHES

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This study integrates results from two major approaches to studying managerial work, one focusing on work content, the other on work process. Clusters of managers having similar work behaviors were first identified in terms of each approach, and major differences among the manager clusters were described. The study next found a moderate convergence in the results of the two approaches. Clusters of managers having similar work content in their jobs were often associated with one or two clusters of work process characteristics. However, the differences between the two clusters of process characteristics associated with one content cluster were often very great. The implicating of these findings for the study of managerial work are discussed and future research directions proposed.

"What do managers do?" Although this general question has received increased research attention in recent years, particularly since Campbell, Dunnette, Lawler, and Weick (1970) lamented the lack of answers. This lack remains as one major impediment to the development of a theory of managerial behavior. To understand reasons why this theoretical and empirical void persists, it is helpful to identify and review the major approaches employed in prior research to investigate the question.

The two discernible approaches to research on this general question are the "behavioral content" approach and the "process characteristics" or work activities approach. The behavioral content approach seeks to provide answers to the question: "What are the common behaviors managers engage in as they carry out their job duties and responsibilities?" There is moderate agreement among the answers provided by various behavioral content studies. For example, studies as widely spaced in time as Hemphill (1960) and Tornow and Pinto (1976) identify similar behavioral dimensions such as: staff service, supervision, internal business control, product/service responsibility, strategy and planning, and complexity and stress (Tornow and Pinto's labels).

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In contrast, the process characteristics or work activities approach seeks to answer the question: "What are the common process characteristics (e.g., features such as duration of activity, mode of communications, mode of contacts) found among managerial jobs?" The findings of researchers adopting this approach have been very consistent in studies conducted in different countries and at different time periods. For example, many—but not all—managers' job are characterized by a large number of brief activities, most of which involve talking with a wide range of internal and external contacts (Carlson, 1951; Mintzberg, 1973; Stewart, 1967).

Although there are notable exceptions, studies following both of these approaches place primary emphasis upon the description of similarities among managers' work behaviors. The identification of differences in manager's behaviors has received much less emphasis, with the notable exception of Stewart's recent process characteristics studies (Stewart, 1982a, 1982b; Stewart, Smith, Blake, & Wingate, 1980). Yet comprehensive knowledge of both similarities and differences in work behavior among managers has widespread theoretical and practical importance. General models of managerial behavior recognize the importance of both kinds of information for succession planning and career development, performance definition and appraisal, and managerial motivation and reward administration (Campbell, et al., 1970). The initial purpose of the present study was to identify and describe similarities and differences in the behavioral content and in the process characteristics of managerial work.

Additionally, while the two approaches are similar as to what is investigated—that is, managerial behavior—they are dissimilar as to the kinds of behavior examined and, understandably, they lead to different conclusions. Including more than one approach has been recognized as important for building theories of work behavior (Pearlman, 1980; Wallace, 1983). One reason for utilizing multiple approaches is to determine the degree of convergence of results obtained by different approaches and the accompanying implications for generality. To what extent is managerial work that is similar in behavioral content also similar as to process characteristics? A second purpose of this study is to provide an initial answer to this question.

Expectations based on prior studies suggest only a moderate convergence of results from these two approaches would be found. Managers can have work with similar behavioral content and can still differ as to what behaviors they choose to emphasize or in their role-making behavior (Graen, 1976; Stewart, 1982a, 1982b). Strauss (1962) found wide differences in both the interpersonal contact patterns and the emphasis placed on oral and written communications among purchasing agents having similar job descriptions. Even work with similar behavioral content allows choices of emphasis and of role-making behaviors. Therefore, a third purpose of the present study is to describe and contrast subgroups of managers whose work is dissimilar as to process characteristics, but similar as to behavioral content.

A final observation is that there have been few attempts to integrate findings from the two approaches. This lack of integration is undoubtedly

due in part to the fact that researchers identified with each approach adopt data collection methods yielding different kinds of information that are the hallmark of each approach. A discussion of these data collection methods follows.

Researchers examining the behavioral content of managerial work have used questionnaires as one major method of data collection (Tornow & Pinto, 1976). A questionnaire is likely to yield valid content to the extent that it includes a large and reasonably representative sample of specific behaviors. Accuracy is likely to be good when the adjectives used to represent different levels of frequency of a behavior are consistent with psychological and psychophysical measurement research evidence (Bass, Cascio, & O'Connor, 1974; Torgerson, 1958). However, by relying primarily on questionnaires, this research approach is limited to investigating the behavioral content of managerial work. Managers' memory limitations make accurate estimates of process characteristics such as activity duration or communication mode difficult to obtain through standard questionnaire methods.

The process characteristics approach commonly uses multiple methods of data collection, such as diaries, time-sampling, interviews, and observation (McCall, Morrison, & Hannan, 1978). Using these methods may reduce memory and recall problems because an accurate cumulative record of the duration and the other dynamic characteristics of each activity is established. A limitation of diaries or observation is that they do not work well for gathering information on behavioral content (Stewart, 1967). These methods also lead to categorization problems, for specific behaviors can be classified into a number of abstract categories. Classification errors are likely to increase when an instance of behavior fits into multiple categories, making the recording task more complex (McCall et al., 1978). As long as these methods are used to obtain an accurate record of behavioral process characteristics they work well, but they are poorer methods for gathering data on behavioral content than are standard questionnaire methods.

In summary, the behavioral content and process characteristics approaches complement each other in the methods of data collection used, as well as in the choice of properties of behavior investigated. If a purpose of a study is to integrate the results of the two approaches and extend the range of questions addressed, then a methodological integration must also occur. The present study, which includes methods of data collection from each approach, reaps the advantages of the complementary strengths of both. By using a combination of methods, the present study seeks to provide a more comprehensive description of the similarities and differences in managerial work.

METHODS

Sample

The managers in this study come from three organizations: a chemical processing company, a hospital, and a bank, including its branches. A random sampling procedure was used to draw equal size samples in each

organization. The final sample comprised 70 managers, 24 from the chemical processing plant and 23 each from the remaining organizations. The one exception to this sampling procedure was that the participation of the top manager in each organization was sought and obtained; we reasoned that if the top manager participated, other managers would be more likely to participate in the study when asked.

Measurement of Behavioral Content

The original version of the Management Position Description Questionnaire (MPDQ) (Tornow & Pinto, 1976) was the measure of behavioral content used. Complete details on the development and validation of the MPDQ can be found in the referenced article. The MPDQ consists of 208 statements describing particular behaviors. In the present study five of the items, asked twice for test-retest reliability estimates, were randomly distributed throughout the questionnaire. The mean reliability in the present sample was satisfactory ($r = .88$). The following are some of the behavioral elements (items) included in the questionnaire:

Analyze and evaluate specific factors as to how they affect company's profitability.

Coordinate the efforts of others over whom I have no direct authority.

Compare actual performance with forecasts and/or schedules.

Promote the Company's products or services.

Work with subordinates to develop them for improved job performance and future responsibility.

Managers were instructed to consider and weigh both a behavior's importance to their position and its frequency of occurrence when evaluating an item's significance. For example, an activity could be done very frequently, but if it were relatively unimportant compared to other activities in that position, the managers were instructed to give the item a low significance value. The reminder to consider both frequency and importance was repeated throughout the questionnaire. The following numerical answer format was used by managers to rate the significance of an item for their positions:

0 = Definitely not a part of the position, does not apply, or is not true.

1 = Under unusual circumstances may be a minor part of the position.

2 = A small part of the position.

3 = A somewhat substantial part of the position.

4 = A major part of the position.

5 = Definitely a significant part of the position.

The present study used the factors from Tornow and Pinto's earlier research as scales and unit-weighted items with significant factor loadings to form scale scores.

Measurement of Process Characteristics

Managers recorded process characteristics or activities on a structured form, a single sheet of paper divided into a number of columns. The present

study's data analysis included thirteen process characteristics, selected on the basis of a review of characteristics found by Stewart (1976, 1982a) and Mintzberg (1973) to distinguish among managers' jobs. These process characteristics include the incidence of two extremes of activity duration (under 5 minutes, more than 60 minutes); the occurrence of five types of contacts (being alone, contact with the boss, with peers in other work units, with subordinates, or with persons external to the organization); whether contact groups consist of two or more members; whether activities involve face-to-face communication; whether activities were scheduled and were self-initiated; and whether the purpose of the activity was information exchange or decision making. The data used in analysis were percentages calculated for each characteristic, based on the number of times it was checked compared to the total number of recorded activities.

Procedures

Completed forms were used to familiarize managers with procedures for recording the process characteristics of a work activity; further examples were elicited from the work activities of the managers and recorded on the form. Beepers, electronic signal devices similar in size to pagers, were then introduced to facilitate time-sampling of managers' activities. Beepers had an internally generated signal that sounded at pre-set intervals during the day once the "on" switch was pressed. Managers completed one line of the form each time the signal sounded, every 25 minutes or about 18 times during an 8-hour workday.

Beepers were used because prior studies have found that the devices yield low percentages of missed self-recordings of a managers' activities (Whitely, 1978). High percentages of recording and the absence of editing are important for obtaining a representative sample of the process characteristics of each work day. A high ratio of actual to potential recordings of 18 per 8-hour day using the beeper method provides some evidence of the degree to which the record was representative of managers' workdays.

Managers recorded the process characteristics of their activities for 7 consecutive days during 2 work weeks. During the afternoon of the first day, a warm-up day to familiarize them with the recording procedure in their natural setting, managers were telephoned and remaining questions resolved. Data from the warm-up day were excluded from analysis.

Analysis

To accomplish the initial purpose of the present study — that is, to describe the similarities and differences in the behavioral content and process characteristics of managerial work — the two vectors of standardized scores for each manager were taken to represent profiles that were analyzed by cluster analysis. Cronbach and Gleser's (1953) inter-subject difference, D^2 , was the measure of profile similarity.

The matrices of D^2 were analyzed using the Ward and Hook (1963) clustering procedure. The selection of this procedure was based on the results of

Blashfield's (1976) Monte Carlo investigation of major clustering algorithms. Briefly summarized, this procedure begins by defining N separate groups. At each step in the algorithm, pairs of groups are combined so that the variance of profiles within groups is at a minimum, a procedure that continues until all groups have been combined into a single group. Changes in the variance measure are used as an aid in determining which step in the algorithm produced the best classification of groups. The results of this initial analysis provide an indication of which managers are similar in terms of the behavioral content of their work and which managers are similar in terms of the process characteristics of their work.

One of the limitations of clustering algorithms is that the results cannot be tested for significance and the variables that contribute significantly to cluster separation are not identified. For this reason, multiple discriminant analyses (MDAs) were computed to aid in identifying the differences among clusters following procedures outlined by Lissitz, Mendoza, Huberty, and Markos (1979). For these analyses, cluster membership was the dependent variable and the 13 scale scores or the selected process characteristics were the independent variables.

In order to determine the extent of convergence of results from the behavioral content and process characteristics clusters, the second goal of this study, a cross-tabulation was run between the two cluster solutions. Additionally, the location of each manager in each cluster solution of the cross-tabulation was determined. This cross-tabulation and the results of the cluster analyses were sources of information for the third and final purpose of the study — determining the extent of differences in the process characteristics of the work of managers whose work was similar in terms of behavioral content.

RESULTS

Behavioral Content Clusters

Following the merger of behavioral content scores into seven clusters, the within-group variance increased drastically, indicating that fewer clusters would have forced together more and more dissimilar groups. The results of the seven-cluster solution were therefore accepted as a beginning point in determining similarities and differences in the behavioral content clusters. The matrix in Table 1 gives means for content dimensions in each of the seven content clusters.

The results presented at the bottom of Table 1 show the general findings for the single significant discriminant functions obtained in the multiple discriminant analysis. The MDA findings showed that nine behavioral content dimensions contributed to the separation of profiles of the seven clusters. These content dimensions and their standardized weights are: complexity and stress, .83; public and customer relations, .75; autonomy of action, .66; product and service responsibility, .60; product, market, or financial strategy planning, .57; coordination of other units and personnel, .55; approval of

financial commitments, .55; broad personnel responsibility, .54; and internal business control .52.

These MDA results can be used in conjunction with Table 1 to highlight the relative contrasts between clusters on each of these behavioral content features. A standard score that exceeded $\pm .05$ standard deviations was considered to indicate that a given behavioral content dimension was a major or minor part of the cluster, and differences between cluster scores greater than 0.5 standard deviations were considered practically significant. Managers in clusters 3, 5, and 7 reported relatively high components of complexity and stress in their work. Public and customer relations was a relatively major component in clusters 3 and 5, but a relatively minor part in clusters 1 and 2. Autonomy of action was relatively high in clusters 3, 4, and 5, but relatively low in clusters 1 and 2. Product and service responsibility was a relatively major component in clusters 3 and 6, but a relatively minor component in clusters 1 and 2. Product, market, and financial strategy planning was relatively high in clusters 2, 5, and 7, and relatively low in cluster 1. Coordination of other units and personnel was a major component in clusters 1, 3, 4, but a relatively minor component in clusters 2, 5, and 6. Approval of financial commitments was relatively high in cluster 5 and relatively low in cluster 2. Broad personnel responsibility was a relatively major component in clusters 1, 3, and 5 and a relatively minor component in cluster 2. Finally, internal business control was relatively high in clusters 2, 3, and 5, but relatively low in cluster 7.

Process Characteristics Clusters

A total of 7,116 recordings of work process characteristics were made by the 70 managers, representing a 94 percent recording rate for the 7,560 possible recordings that could have been made. The lowest response rate for any single manager was 89 percent (95/108). The validity check of how typical the activities of the recording day were compared to other work days indicated that the range of managerial reports was from "typical" to "very typical" ($\bar{x} = 4.32$; $s.d. = 0.30$). On the average, managers indicated that there was only a slight difference between process characteristics on the observation days and those on a typical work day. This check and the high recordings rate indicate that the method of data collection yielded a representative sample of daily work activities. Therefore, all 7,116 observations were included in the data analysis and percentages for each of the 13 process characteristics were calculated for each manager based on the number of times it was marked in the total number of activity recordings.

Following the merger of managers' scores into six clusters, the within-group variance increased rapidly with further clustering, so the six-cluster solution was taken as a parsimonious starting point for an examination of the similarities and differences in managers' work processes. The matrix in Table 2 shows the mean activity characteristic profiles for each of the six clusters; multiple discriminant analysis was again used to identify the variables that contributed significantly to cluster separation. The general findings for this

analysis are shown at the bottom of Table 2; two significant discriminant functions were obtained.

An examination of the standardized weights for each function provides information about the specific process characteristics contributing to cluster separation. In the first function, the most discriminating characteristics and their weights are: scheduled activities, 0.76; activities of more than 60 minutes duration, 0.68; peer contacts, 0.63; boss contacts, 0.57; activities of less than 5 minutes duration, -0.63; and external contacts, -0.49. In the second function, the most heavily weighted characteristics and their respective weights are: activities of less than 5 minutes duration, 0.52; subordinate contacts, 0.58; being alone, 0.48; and activities involving two or more others, -0.48.

Two considerations that governed comparisons between process characteristics clusters were based on these discriminant analysis findings. First, the previous rules were again used to define major and minor process characteristics and to define practically significant differences between clusters. Second, comparisons between clusters were restricted to major differences and smaller differences unlikely to be practically significant are not discussed.

Table 2 highlights the relative contrasts on each of these process characteristics between clusters. The percentage of scheduled activities was relatively high for managers in cluster E but relatively low for managers in cluster D. Activities of more than 60 minutes duration were a major element for managers in cluster C, but a relatively minor element for managers in cluster E. The number of peer contacts was relatively high in clusters A and B, but relatively low in clusters C and E. Boss contacts were relatively frequent in cluster F, but relatively infrequent in clusters C and E. Activities of less than 5 minutes duration were frequent in clusters B, D, and E, but infrequent in clusters C and F. Finally, external contacts were relatively frequent in clusters E and F, but relatively infrequent in cluster D. Using information from the second function, the following additional clusters can be highlighted: subordinate contacts were relatively frequent in cluster A, but infrequent in clusters B, C, and F; lastly, activities involving two or more others were relatively frequent for managers in clusters B and F, but relatively infrequent for managers in clusters A and C.

Convergence of Results

A second purpose of this study was to determine the degree of convergence of the two approaches. The small sample size made it likely that in some instances there would be a single modal process cluster associated with a particular content cluster, while in other instances there might be bimodal concentration of managers in process clusters associated with another content cluster. Therefore, the rule established for a statement of convergence was that the two most prominent process clusters associated with a content cluster should jointly include at least half of the managers in that content cluster. For two process clusters to be associated with a content cluster, each should also include at least two of the managers in that content

cluster. If managers were randomly distributed, each of the six process clusters that intersect a content cluster would include approximately 17 percent of them; the convergence rule raises the chance level to 34 percent of the managers randomly distributed in process clusters that intersect a content cluster.

Table 3 shows results of the cross-tabulation of managers according to their cluster membership in each of the cluster solutions. There is a bimodal concentration of managers in the process clusters associated with content clusters 1, 2, 4, 6 and 7, under the rules established. There is a single modal process cluster (F) associated with content cluster 3, and a single modal process cluster (E) for the five managers in content cluster 5.

On the average, 56 percent (39/70) of the managers in a given content cluster were located in one or two of the process clusters under the established rules. As this observed percentage was significantly ($p = .045$) greater than the change percentage, using a Z-score transformation (Courts, 1966), we concluded that there is moderate convergence between the findings of the two approaches.

TABLE 3
Cross-Tabulation of the Number of Managers in Each
Behavior Content and Process Characteristics Cluster

Process Clusters	Content Clusters							Total
	1	2	3	4	5	6	7	
A	2	4	1	1	0	2	1	11
B	1	2	1	4	0	1	1	10
C	1	5	1	1	1	3	2	14
D	1	3	1	3	0	3	1	12
E	1	1	1	1	3	2	3	12
F	3	0	4	1	1	1	1	11
Total	9	15	9	11	5	12	9	70

Intracluster Differences

A final purpose of this study was to determine the extent of differences in process characteristics seen among managers whose work was similar in behavioral content. Table 4 provides an illustration of the contrasts between the two major process clusters associated with the seven content clusters; functions of managers appear in Table 4 as an aid to interpretation.

The results presented in Table 4 indicate that coordination of other units with personnel and broad personnel responsibility were major behavioral content activities in content cluster 1; the majority of managers in this cluster were found in process characteristics clusters A and F. Process cluster A included two personnel managers who each had a relatively high percentage of scheduled activities that involved one other person; these activities

included lateral or peer and subordinate contacts. When not engaged in these activities, these managers each had a relatively high percentage of activities for which they were alone. The maintenance, production operations, and engineering managers in cluster F showed dissimilar patterns for these process characteristics.

Internal business control was a major content area for managers in content cluster 2, the majority of whom were found in the process characteristics clusters A and C. The accounting and treasurer jobs in process cluster A were both characterized by a high percentage of scheduled activities of less than 60 minutes' duration and by an even higher percentage of boss and lateral contacts. The group manager, the branch bank manager, the manager of management analysis and the medical reimbursement managers in cluster C showed dissimilar patterns for these process characteristics.

Advanced consulting, coordination of other units and personnel, and autonomy of action were three major content areas for managers in content cluster 4, the majority of whom were found in process characteristics clusters B and D. Managers in cluster B (an accounting manager, a chemical synthesis manager, an engineering manager, and a project manager) each had a relatively low percentage of activities for which they were alone, and a relatively high percentage of scheduled activities involving two or more others, one of whom may have been their boss. These managers had relatively low percentages of subordinate contacts. The hospital administrators and the staff support manager in cluster D had moderate percentages of subordinate contacts and had relatively low percentages for the other three comparisons.

Major content areas in content cluster 6 were supervision and product or service responsibility. Half the managers in this cluster were found in the C and D process characteristics clusters. Managers in cluster C (a project manager, a production manager, and a hospital services manager) each had a moderate percentage of scheduled activities, a relatively low percentage of activities of short duration (less than 5 minutes), but also a relatively low percentage of activities of long duration (more than 60 minutes). Finally, they each had a relatively low percentage of peer and subordinate contacts. Managers in cluster D (an assistant branch chief, a project manager, and an assistant hospital administrator) had very low percentages of scheduled activities, a duration pattern dissimilar to that of cluster C managers, and moderate percentages of peer and subordinate contacts.

The majority of managers in content cluster 7, whose major content areas were product, market, and financial strategy planning and approval of financial commitments, were found in process characteristics clusters C and F. The marketing and finance managers in cluster C had relatively high percentages of activities of long duration, high percentages of periods when they were alone, and low percentages of boss and peer contacts. Their external contacts were of moderate frequency. By comparison, the two bank vice-presidents and the assistant hospital administrator in process characteristics cluster F had frequent activities of moderate duration (greater than 5

TABLE 4
Behavioral Content, Job Function, Degree of Convergence and Process Characteristics Differences in Managers' Jobs

Behavior Content Cluster and Major Behavioral Features	Major Process Characteristics Clusters and Cluster Differences
<p>Cluster 1 Coordination of other units with personnel Broad personnel responsibility</p>	<p>Includes managers with jobs in personnel, maintenance, production operations, and engineering. Five of the nine managers in the content cluster are found in the A or F process clusters. These two process clusters differ by more than one-half s.d. on frequency of scheduled activities, being alone, activities involving two or more others, and peer contacts.</p>
<p>Cluster 2 Internal business control</p>	<p>Includes managers with jobs in accounting, management analysis, medical reimbursement and a branch bank manager, a group manager, and a treasurer. Nine of 15 managers in the content cluster are found in the A or C process clusters. These two process clusters differ from each other by more than one-half s.d. on frequency of scheduled activities, activities lasting 60 minutes or more, boss contacts, and peer contacts.</p>
<p>Cluster 3 Coordination of other units with personnel Complexity and stress Autonomy of action Staff service</p>	<p>Includes managers with jobs in customer services, marketing services, and group benefits, and a nursing department director. Four of the nine managers in the content cluster are found in process cluster F. Major process characteristics include activities involving two or more others, being alone, and boss contacts.</p>
<p>Cluster 4 Advanced consulting Coordination of other units with personnel Autonomy of action</p>	<p>Includes managers with jobs in accounting, chemical synthesis, engineering, staff support, project management, and hospital administration. Seven of the 11 managers in the content cluster are found in process clusters B or D. These two process clusters differ by more than one-half s.d. on frequency of scheduled activities, self-initiated activities, being alone, contacts with two or more people, boss contacts, subordinate contacts, external contacts, and information exchange.</p>

TABLE 4 (continued)

Behavior Content Cluster and Major Behavioral Features	Major Process Characteristics Clusters and Cluster Differences
<p>Cluster 5</p> <p>Product, market, and financial strategy planning</p> <p>Broad personnel responsibility</p> <p>Approval of financial commitments</p> <p>Internal business control</p> <p>Public or customer relations</p>	<p>Includes a chief hospital administrator, and the presidents of the bank and of the chemical processing company. Three of the five managers in the content cluster are found in process cluster E. Major characteristics of this cluster are external contacts, activities of less than 5 minutes duration, and information exchange.</p>
<p>Cluster 6</p> <p>Supervision</p> <p>Product or service responsibility</p>	<p>Includes managers with jobs in project management, production, hospital services, quality assurance, collections, and a department head. Six of the twelve managers in a content cluster are found in process clusters C or D. These two process clusters differ by more than one-half s.d. on frequency of activities of less than 5 minutes or more than 60 minutes duration, face-to-face communications, peer contacts, subordinate contacts and information exchange.</p>
<p>Cluster 7</p> <p>Product, market, and financial strategy planning</p> <p>Approval of financial commitments</p>	<p>Includes two bank vice-presidents, a hospital administrator, a marketing manager, and a financial manager. Five of the nine managers in the content cluster are found in process clusters C or E. These two process clusters differ by one-half s.d. on frequency of scheduled activities, activities of less than 5 minutes or more than 60 minutes duration, face-to-face contacts, being alone, subordinate contacts, external contacts and information exchange.</p>

minutes but less than 60 minutes), were alone relatively infrequently, and had somewhat dissimilar patterns of boss, peer, and external contacts to managers in cluster C.

DISCUSSION

Stewart recommended that research "move on from Mintzberg's (1973) roles and propositions about managerial work to an analysis that takes into account the variations in behavior and the differences in jobs before attempting to generalize about managerial work" (1982b: 11). The findings in Tables 1 and 2, which address Stewart's recommendation, show that, regardless of approach, there are large differences among the work behaviors of managers. These differences should sound a note of caution, warning researchers not to make overgeneralizations based on similarities in managerial work behavior. To develop a more valid propositional inventory or theory of managerial work, it will be necessary to understand differences in managerial jobs and to investigate reasons for these differences.

The findings in Table 2, showing major differences among the process characteristics of managerial jobs, also provide support for the midrange model and classification system proposed by Stewart (1976). Basic to Stewart's classification system are variations in the contact pattern of the manager (external, internal-vertical, internal-lateral), a distinction between working alone or with others, and variations in duration of activities — process characteristics that separated the clusters in the present study. In addition, these findings and Stewart's classification system provided links to other research. For example, Kipnis, Schmidt, and Wilkinson (1980) found major differences in the social influence processes used by managers depending on whether their contact was with a boss, a subordinate, or a peer. One future research direction would be to link managerial work research with the resurgent interest in social influence processes used by managers.

These managerial work differences also have important practical implications, for instance, for career planning and management development. Comparison of profiles could be used in career pathing and development for transfer or promotion purposes. For example, product, market and financial strategy planning, internal business control, public and customer relations, autonomy of action, approval of financial commitments, advance financial responsibility, and broad personnel responsibility are more frequent and important behaviors for the bank president in content cluster 5 than for the bank vice-president in cluster 7. If the bank board were planning to promote the vice-president, additional development and training on and off the job could help him develop the important behaviors found more frequently in the president's job.

While the present findings address Stewart's (1982b) recommendation, they also extend it to the study of variability of work processes in managers' jobs even when the behavioral content of the work is similar. The findings in Table 4 show large differences in process characteristics among the jobs of

managers within a single behavior content cluster. One interpretation of this finding is that, to some degree, managerial work is what the manager decides to make of it, an interpretation consistent with Dunnette's (1966) notion of employee-determined change, Graen's (1976) model of role-making behavior, and Stewart's (1982a) discussion of choices of behavioral emphasis.

These findings and the explanation offered raise two important research questions. First, what are the kinds of choices concerning behavioral emphasis managers make when they have some degree of latitude to shape the process characteristics of their work? One tentative answer to this question is suggested by the findings in Table 4, which shows a somewhat bimodal distribution of process characteristic profiles in content clusters 1, 2, 4, 6, and 7, but a single mode of process characteristics in content clusters 3 and 5. Levels of frequency of scheduled activities, of activities of both short or long duration, and of peer contacts are prominent in differentiating managers within the bimodal content clusters, but these process characteristics are not major characteristics in the single-mode content clusters. Managers in the former clusters may have a greater latitude of choice on these characteristics than do managers in the latter two content clusters. A second research question is the extent to which latitude in the choice of process characteristics influences subsequent changes in the behavior content of managerial work. Answers to these questions would have considerable interest for researchers in human resource management, and for organization and management theorists interested in the concepts of bounded rationality and organizational design.

These differences in process characteristics within a behavior content cluster also have practical implications. Several of the process characteristics that distinguished among managers concern verbal communication patterns. An interesting practical question is the extent to which these differences in communication patterns are related to the differential effectiveness of managers whose work has similar behavioral content. Strauss (1962) found that differences in lateral communication patterns of purchasing agents were related to their performance effectiveness, and Graen's (1976) vertical dyad model of the latitude managers negotiate in their jobs also suggests a possible relationship between the critical choices managers make as to how to go about their work and their effectiveness. Those who manage human resource research efforts could find a large and interested audience for findings addressing this question, not only in their companies, but also among their academic colleagues.

While Stewart (1982b) has pointed out a need to recognize differences among managerial jobs, her distinction between demands, constraints, and choices (Stewart, 1982a) is also useful in interpreting the moderate convergence of results from the two approaches shown in Table 3. Often these areas of convergence of results make intuitive sense. For instance, the behavioral content in content cluster 1 emphasizes coordination of other units and personnel, and process characteristics clusters A and F indicate above-average percentages of peer contacts that are consistent with this coordination

emphasis. A second example is found in the emphasis on product, market, and financial strategy planning, and on public or customer relations among managers in content cluster 5. The associated process characteristics cluster E reveals a level of external contacts well above the average for all managers. One explanation for the convergence of results is that the constraints and demands of behavioral content influence the process characteristics of managerial work. Alternatively, for managers with sufficient latitude to shape their jobs, changes in behavioral content, including behavioral demands and constraints, may result in their choosing particular process characteristics — certain contact patterns, for instance, as Strauss (1962) found. Future research will need to address these alternative explanations with appropriate longitudinal designs.

In addition to the importance for a future theory of managerial work, this moderate convergence of findings from the two approaches should interest researchers in human resources and in organizational communications. There is a recognized need for identification of job families as a basis for the development of a multi-level theory of managerial work, and for purposes of validity extension and generalization (Pearlman, 1980; Schmidt & Hunter, 1977; Wallace, 1983). The present findings suggest that noble as these pursuits may be, they would be only partially successful as human resource practices for managers. A more fruitful approach suggested by the present results would be to identify pockets of convergence, but to recognize differences between these pockets and within these pockets. In managerial staffing and selection, this approach would suggest a strategy of synthetic validation much like the one proposed by Dunnette (1963).

The conceptual analogues of job families in organizational communications are groups and roles in communication networks — specific sets of linkages among a defined set of persons that can be used to interpret their behavior (Mitchell, 1969). Past network research has investigated the exchanges of information among a set of persons, the strength or frequency/duration of contacts in a given time period, and the structural characteristics of individuals in a network (Tichy, Tushman, & Fombrun, 1979). The information provided by such an approach on dynamic communication properties — such as contact patterns, duration of contact, frequency of contact, and initiation of contact — when combined with knowledge of the content of the jobs of set members, could provide a more complete description of managerial networks, including information on coalitions, liaisons, or isolates. Changes in the process characteristics shown by network members could indicate changes in the behavioral content of jobs and in the operational organization design.

The results of the present study have widespread relevance for several areas in which researchers seek to understand managerial behavior, including human resource management, organizational behavior, organizational communications, and organization and management theory. Conceptually, the present findings and properties of each of these areas of inquiry have been integrated in the general validity model proposed in the seminal book

by Campbell and his colleagues (1970). Research explicitly testing this model is virtually non-existent. Future research in each of these areas of inquiry could use this model as a conceptual guide to integrate and test propositions that would increase our understanding of managers and their work.

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OUTCOMES OF ROLE STRESS: A MULTISAMPLE CONSTRUCTIVE REPLICATION

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Responses from four separate samples of accountants and hospital employees provided a constructive replication of the Bedeian and Armenakis (1981) model of the causal nexus between role stress and selected outcome variables. We investigated the relationship between both role ambiguity and role conflict — as specific forms of role stress — and job-related tension, job satisfaction, and propensity to leave, using LISREL IV, a technique capable of providing statistical data for a hypothesized population model, as well as for specific causal paths. Results, which support the Bedeian and Armenakis model, are discussed in light of previous research.

An especially rich and diverse literature investigating the relationship between role perceptions and work-related attitudes and behaviors has appeared over the past decade. Researchers have linked two specific forms of role stress, role ambiguity and role conflict, to many dysfunctional work-related variables (for recent reviews, see Fisher & Gitelson, 1983; and Jackson, Zedeck, Lyness, & Moses, 1983.)

CAUSAL MODELS OF ROLE STRESS

Despite abundant research, understanding of the nomological niche of role stress has lagged. Love and Beehr (1981) suggested that a principle reason for this slow development was that few studies have examined role stress and job-related strain within a multivariate causal framework. Increasingly, causal modeling has become important to the formulation and evaluation of theoretical models in all areas of the social sciences (Bentler, 1980). As a method of theory testing, it can help determine whether sample data sufficiently represent a hypothesized population model. Causal modeling methods are particularly helpful in locating specification errors, that is,

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improper inclusion or misplacement of variables within a causally related network. Adequacy-of-fit criteria are the usual means employed to statistically test appropriateness of hypothesized causal relationships. In addition to their value in testing the plausibility of sample-based models, causal models are especially well-suited to evaluating competing models that cannot be completely specified (Huba, Woodward, Bentler, & Wingard, 1978). Understanding role stress will require developing adequately specified explanatory models that broaden our knowledge of its relationship to various job-related variables. Lacking such models researchers cannot justify strong conclusions about the antecedents and consequences of role stress.

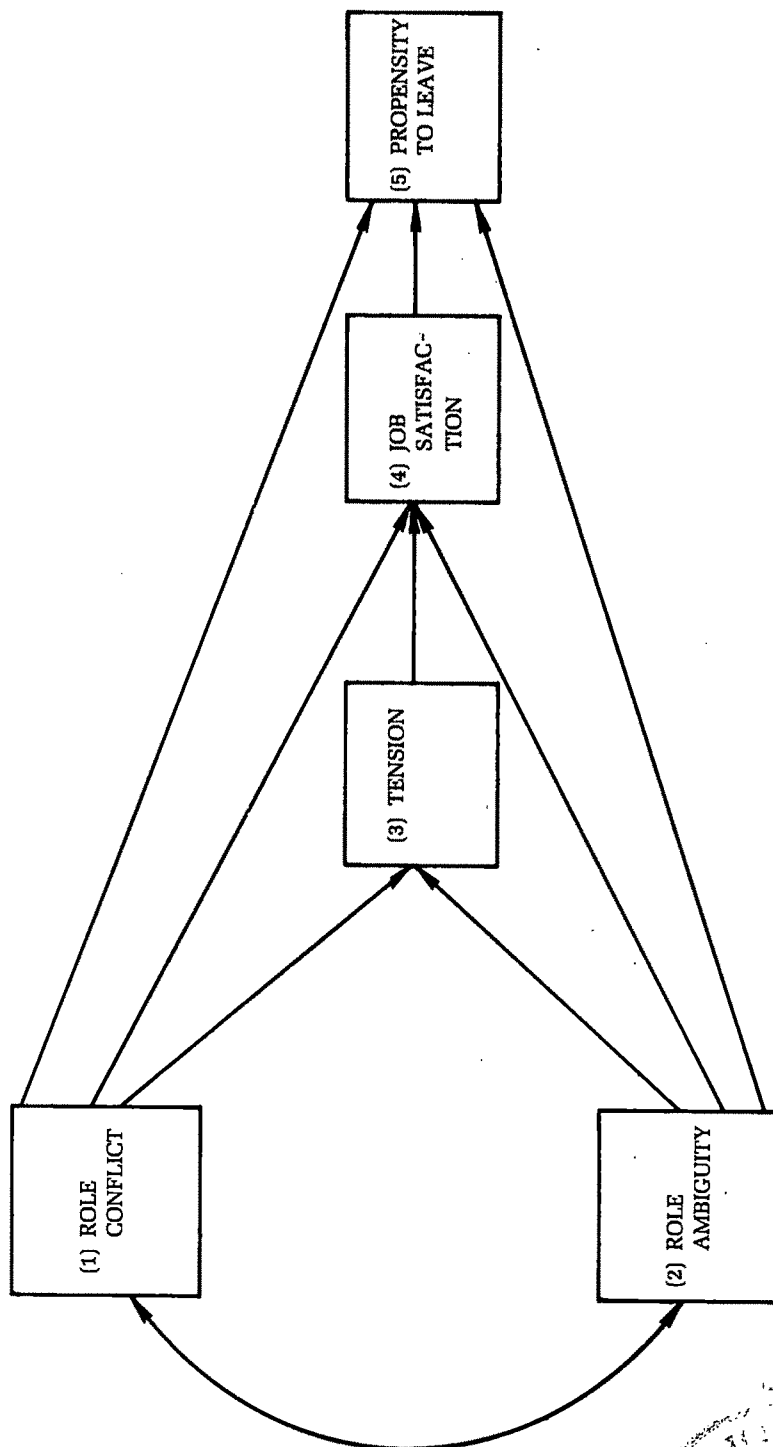
An example of the application of causal modeling methods within a role scheme is Bedeian and Armenakis's (1981) path analysis of a proposed causal model describing the effects of role conflict and role ambiguity on job-related tension, job satisfaction, and intention to leave. A large-sample chi-square test of significance revealed that the hypothesized paths fit the data obtained, thereby providing support for the model.

More recently Jackson (1983a) reported a study employing path analysis to investigate role-related variables. In conjunction with an experimental design, she used path analysis to describe the effect of participation in decision making on role conflict, role ambiguity, job satisfaction, absenteeism, and intentions to leave for 126 hospital employees. A test of her model revealed that the hypothesized paths did not fit the data obtained, a result suggesting that certain paths had been inappropriately omitted. After Jackson revised the model using intercorrelations of study variables and relevant path coefficients, chi-square tests comparing the variance explained by the new model with that explained by the original model confirmed that the revision adequately represented her data. Commenting on this result, Jackson noted because she had postulated the revised model post hoc, the model should be independently retested.

Jackson's (1983a) revised model somewhat overlaps with Bedeian and Armenakis's (1981) causal model, depicted in Figure 1, in which role conflict and role ambiguity exert direct causal influence on job-related tension, job-satisfaction, and propensity to leave an organization. According to this model, job-related tension directly influences level of job satisfaction, which in turn influences propensity to leave. Jackson found support for several of these causal paths — role conflict and role ambiguity leading to emotional strain, emotional strain leading to lack of job satisfaction, and lack of job satisfaction leading to intention to leave.

Since Jackson's final model was formulated post hoc, the possibility remains that the reported findings were spurious. A number of researchers have expressed the belief that independent replication is the only satisfactory solution for establishing whether empirically-based modifications represent genuinely valuable information about a model (e.g., Bentler, 1980). As Bentler and Bonett (1980:604) state, "when a model is modified empirically rather than theoretically, cross-validation or another method for assuring that the statistical theory is not grossly violated becomes essential." Since

FIGURE 1
Bedeian and Armenakis's Causal Model
of the Consequences of Role Conflict and Ambiguity



independent replications do not violate a priori assumptions of hypothesis testing, they provide a means for determining whether an empirically derived model has capitalized inordinately on sample specific covariation. Hence, when particular patterns of results are duplicated with some consistency despite the inevitable definitional or operational disparities that occur across replications, it is generally held that the results represent a relatively robust phenomenon (Keppel, 1982).

The present study is an attempt to provide a constructive replication (Lykken, 1968) of the Bedeian and Armenakis (1981) causal model across four separate samples: three samples of accountants, and Jackson's sample of hospital employees.

METHODS

Subjects

Subjects for the accountant samples were randomly drawn from membership lists of the Association of Government Accountants, American Society of Certified Public Accountants, National Association of Accountants, and American Association of Woman Accountants. From these lists, we identified three samples of accountants: public accountants ($n = 275$), government accountants ($n = 254$), and industrial accountants ($n = 459$). The fourth sample employed in this investigation was derived from Jackson's (1983a) posttest 2 data ($n = 66$) from hospital employees.

Measures

Role conflict and role ambiguity for the accountant samples were, respectively, measured by 6- and 8-item scales developed by Rizzo, House, and Lirtzman (1970). Role conflict and role ambiguity were measured in Jackson's (1983a) study using a new instrument developed by House, Schuler, and Levanoni (1983).

We measured job-related tension for the accountant samples with a 9-item index obtained from Lyons (1971) that was designed to assess the frequency with which a person reports being bothered by work-related variables. The counterpart to this measure in the Jackson (1983a) study was overall emotional strain, measured through responses to the 30-item General Health Questionnaire (Goldberg, 1972). Each item describes a medical symptom.

The Minnesota Satisfaction Questionnaire (MSQ), short form (Weiss, Dawis, England, & Lofquist, 1967), assessed job satisfaction in all four samples. Although the MSQ derives three scores for each respondent (intrinsic, extrinsic, and overall satisfaction), we used only the overall satisfaction score in our analysis.

For the accountant samples, we measured propensity to terminate employment with a 3-item scale developed by Lyons (1971). Jackson assessed intentions to leave for the hospital sample through responses to the question, "Are you planning to quit your job at (organization) in the near future?"

Analysis

Covariance matrices for each sample were evaluated by LISREL IV (Jöreskog & Sörbom, 1978), a program that yields a maximum likelihood solution for the parameters of a hypothesized model, and allows statistical analysis on two levels, the individual and the comprehensive. This program provides path coefficient estimates along with approximate *t*-values to determine the statistical significance of hypothesized individual relations. For comprehensive analysis, the program computes a chi-square goodness-of-fit statistic to assess whether all of a model's hypothesized relations considered together provide an appropriate description of population data.

Even though LISREL IV can analyze multisample covariance structures simultaneously, we decided to examine samples individually for two reasons. First, the focal constructs were not measured by the same instruments for all samples. To control for measurement differences, we would have had to analyze correlation rather than covariance matrices, which would have been tantamount to standardizing the data and eliminating any mean group differences. Analyzing correlation matrices, rather than covariance matrices, could have resulted in a solution that appeared to be a better fit across sample than was actually the case. Second, having used only a single indicator of each construct in this study, we expected a certain degree of variability in path coefficients (due to measurement error) across samples — a variability that could conceivably have inflated the chi-square goodness-of-fit statistic, suggesting that the proposed model did not provide a plausible representation of the system of influences among variables in the population.

The hypothesized model tested in the present study (illustrated in Figure 1) included two exogenous variables (role conflict and role ambiguity), and three endogenous variables (tension, job satisfaction, and propensity to leave). Consistent with past research and theory, we omitted the causal path from tension to propensity to leave for all four groups (Van Sell, Brief, & Schuler, 1981).

RESULTS

Mean scores, standard deviations, and coefficient alpha reliability estimates were computed for each measure by sample.¹ Inspection of coefficient alphas was necessary, as a wide divergence in reliabilities could have resulted in an analysis that placed the most reliable indices at the center of a hypothesized model. We calculated standard deviations of the reliabilities obtained with the four samples for each instrument. The resulting standard deviations ranged from .05 to .06, indicating that instrument reliabilities were similar and relatively homogeneous across all samples.

Chi-square values resulting from LISREL goodness-of-fit analyses were as follows: public accountants, 5.97 with 1 *df* ($p < .02$); government

¹A table giving mean scores, standard deviations, and reliability estimates for each measure by sample is available from the authors.

accountants, 1.50 with 1 *df* ($p < .23$); industrial accountants, 5.53 with 1 *df* ($p < .02$); Jackson's hospital employees, 8.10 with 1 *df* ($p < .004$). In each instance but one (government accountants), the test statistic was significant. Although this result might be viewed as disconfirmatory evidence, Jöreskog (1978) and others (e.g., Maruyama & McGarvey, 1980) have warned that since the chi-square statistic is a direct function of sample size, the probability of rejecting a hypothesized model increases as *N* increases. Consequently, with large samples, virtually all models would be rejected as statistically untenable.

In response to this dilemma, previous researchers have recommended two alternatives to the chi-square statistic for assessing goodness-of-fit with causal models: a χ^2/df ratio (Boruch & Wolins, 1970) and an incremental fit index (Bentler & Bonett, 1980). Boruch and Wolins suggest that dividing the degrees-of-freedom for a causal model into the chi-square value produced by the application of that model indicates goodness-of-fit. Since degrees of freedom for our hypothesized model equal one, the χ^2/df ratios are equal to the chi-square values resulting from the LISREL goodness-of-fit analyses. Schmitt and Bedeian (1982), and others, have considered a 10:1 ratio or less to be an acceptable fit; by this criterion, our results, with no ratio larger than 8.10:1, represent a reasonable fit. A second recommended means for estimating the fit of a causal model is to assess its explanatory power over-and-above a null model that postulates independence among focal variables. Applying this notion, Bentler and Bonett (1980) developed an incremental fit index, delta (Δ), which can be expressed as

$$\Delta_{nm} = \frac{(F_n - F_m)}{F_n} \quad (1)$$

where F_n refers to the chi-square value under the null model previously proposed, and F_m refers to the chi-square value obtained from the hypothesized model. The resulting difference index (Δ_{nm}) lies in the interval $0 < \Delta_{nm} < 1$ and represents the incremental fit of a causal model. The use of delta also provides a measure of the remaining increment in fit possible by the use of a better model, in that the remaining possible increment is equal to $1.0 - \Delta$. While the distribution of delta is unknown, Bentler and Bonett suggest that an incremental value less than 0.9 can usually be improved. In the case of samples larger than 100, Bearden, Sharma, and Teel (1982) contend that an incremental value less than 0.95 indicates a poor fit.

For each sample, we used LISREL IV to generate chi-square values for a null model of "modified independence," one that allows exogenous variables to correlate (Bentler & Bonett, 1980: 596). Table 1 displays these values for each sample, along with the chi-squares and incremental fit indices for the hypothesized model. In contrast to Jackson's sample, the three accountant samples support the hypothesized model according to Bentler and Bonett's incremental fit index.

TABLE 1
Summary Statistics for Chi-Square Goodness-of-Fit
Tests and Incremental Fix Indices^a

Sample	n	Null Model		Hypothesized Model		Incremental Fix Index	
		χ^2	df (1)	χ^2	df (2)	Δ	(3)
Government accountants	254	571.96**	9	1.50	1		.997
Public accountants	275	579.58**	9	5.97*	1		.990
Industrial accountants	459	902.88**	9	5.53*	1		.994
Jackson's hospital employees	66	58.14**	9	8.10**	1		.861

^aBentler and Bonnett (1980).

* $p < .05$

** $p < .001$

Table 2 shows maximum likelihood parameter estimates for the model in the Figure for each sample, as well as the approximate *t*-statistic for each path (obtained by dividing its path coefficient by its standard error) and associated *p* levels.

Several comments regarding the reported goodness-of-fit criteria are in order. From Table 1, it should be clear that the calculated fit indices do not support uniform conclusions. First, as mentioned above, the chi-square tests

TABLE 2
Maximum Likelihood Estimates on Four Samples for Model in Figure 1^a

Parameter	Sample	Estimate	<i>t</i> -value	<i>p</i> ^b
13 ^c	Public accountants	.587	13.119	.005
Role conflict	Government accountants	.590	13.511	.005
→ Tension	Industrial accountants	.628	18.565	.005
	Jackson's hospital employees	.215	1.811	.050
23	Public accountants	.282	6.308	.005
Role ambiguity	Government accountants	.320	7.327	.005
→ Tension	Industrial accountants	.231	6.824	.005
	Jackson's hospital employees	.346	2.918	.005
14	Public accountants	-.076	-1.124	n.s.
Role conflict	Government accountants	-.043	-0.552	n.s.
→ Satisfaction	Industrial accountants	-.001	-0.026	n.s.
	Jackson's hospital employees	-.302	-2.659	.005
24	Public accountants	-.556	-9.975	.005
Role ambiguity	Government accountants	-.479	-7.342	.005
→ Satisfaction	Industrial accountants	-.438	-10.137	.005
	Jackson's hospital employees	-.170	-1.439	n.s.
34	Public accountants	-.063	-0.884	n.s.
Tension	Government accountants	-.119	-1.400	n.s.
→ Satisfaction	Industrial accountants	-.249	-4.382	.005
	Jackson's hospital employees	-.261	-2.254	.025
15	Public accountants	.224	4.409	.005
Role conflict	Government accountants	.250	5.025	.005
→ Propensity to leave	Industrial accountants	.224	6.001	.005
	Jackson's hospital employees	.068	0.500	n.s.
25	Public accountants	.108	1.792	.050
Role ambiguity	Government accountants	.093	1.656	n.s.
→ Propensity to leave	Industrial accountants	.067	1.587	n.s.
	Jackson's hospital employees	-.048	-0.362	n.s.
45	Public accountants	-.488	-8.526	.005
Satisfaction	Government accountants	-.541	-10.375	.005
→ Propensity to leave	Industrial accountants	-.543	-13.277	.005
	Jackson's hospital employees	-.328	-2.409	.010

^aBedeian and Armenakis (1981)

^bOne-tailed test

^cCodes refer to paths in the model.

of significance suggest that data from only one sample — government accountants — supported the model in question. Second, the magnitudes of the χ^2/df ratios (Boruch & Wolins, 1970), supported the hypothesized model across all four samples. And finally (as shown in column 3 of Table 1), Bentler and Bonett's incremental fit index supported the Bedeian and Armenakis model in the three accountant samples but not Jackson's hospital employee sample. Since choice of index will obviously influence inferences made regarding the fit of sample data to a hypothesized model, which fit index should be used? Bentler and Bonett (1980) circumvent this problem by suggesting that goodness-of-fit be based on multiple criteria. A clearer picture emerges when the results presented in this paper are viewed within this context.

For the government accountant sample, the problem of which fit index to use is not an issue: the data fit the hypothesized model using all three criteria. The results obtained from the remaining three samples highlight the importance of employing multiple criteria. The chi-square goodness-of-fit test rejected the null hypothesis for the public accountant, industrial accountant, and hospital employee samples. As previously mentioned, this result was possibly an effect of sample size. The χ^2/df ratios suggested that fit was adequate in all three cases, so we had to turn to Bentler and Bonett's incremental index to determine the degree of fit of the sample data to the hypothesized model.

As Table 1 shows, calculated incremental fit indices indicated that the hypothesized model represented a substantial improvement over the null model for both the public and industrial accountants. The fit index of .861 for Jackson's hospital employee sample indicates that the hypothesized model could be improved substantially. Since both the χ^2/df ratios and incremental fit indices indicate that the hypothesized model appropriately captured the data for the industrial and public accountant samples, it seems likely that significant chi-square values for them were due to large sample sizes. Given this fact, we can reason that these samples supported the hypothesized model. However, since Jackson's hospital employee sample yielded a significant chi-square value and an unacceptable incremental fit index, we can reason that it did not support the proposed model.

DISCUSSION

Data from three of the four samples tested supported the Bedeian and Armenakis (1981) model. With respect to Jackson's hospital employee sample, besides the small sample size ($n = 66$), the most likely reason for the lack of fit was variation of measures: job-related tension was measured in the accountant samples, but Jackson (1983a) measured overall emotional strain. Our failure to find support for the hypothesized model from hospital employee sample suggests that job-related tension and overall emotional strain are differentially related to the other measured variables, which is understandable, since job tension is but one component of overall emotional strain. Further, we can attribute the lack of fit to the fact that Jackson administered a 30-item

health questionnaire to measure overall emotional strain. Physical (medical) symptoms are not equivalent to the degree an individual is bothered by job-related tension. Moreover, Kemery, Benson, and Sauser (1983) reported physical symptomatology to be a consequence of role conflict, role ambiguity, and job satisfaction.

As regards the three accountant samples, statistical evidence supported the causal paths in the hypothesized model in almost all cases, the weakest support being that for the causal paths between role conflict and job satisfaction and those between role ambiguity and propensity to terminate employment. Within the context of the proposed model, role conflict and role ambiguity exerted a direct influence on job-related tension, job satisfaction, and propensity to leave an organization, and at the same time appeared to have indirect influences as well. Increases in role conflict, for example, led to decreases in job satisfaction both directly and indirectly because role conflict also results in greater job-related tension. This conditional relationship is interpretable in the context of what is known about the generation of work tension (Brief, Schuler, & Van Sell, 1981). Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964) have shown that role conflict is partly a cognitive variable tied to task responsibilities. Consequently, job-related tension that is task specific would be expected to occur first and then decrease general job satisfaction. This same argument may well apply to role ambiguity.

Several other implications of the hypothesized model are also noteworthy. The proposed model suggests that one way to increase job satisfaction and decrease employee propensity to terminate employment is to attenuate role-based stressors. Such adjustments, however, may not be possible in certain occupations; role conflict may be inherent in some jobs, such as nursing (Jackson, 1983b), and role ambiguity may be inherent in others — for instance, upper management.

Another implication of the proposed model is that when modifying situational factors cannot eliminate potential stressors, focusing on intermediate variables in the hypothesized causal chain can minimize their impact. The present model suggests that reducing felt job tension can minimize the impact of role-based stressors. For instance, introducing effective coping strategies, such as communication improvements or stress management skills, would likely increase employees' job satisfaction and decrease their desire to leave an organization. Intervening further along the causal sequence has another advantage. To the extent that other job-related variables cause an increase in job-related tension, interventions geared toward tension reduction will attenuate their eventual effect. Therefore, use of this prescription may also reduce the effects of potential stressors not included in the model.

Additionally, it should be noted that not all causal paths were significant in each sample, a finding that suggests several possibilities. First, there may be situational or personal characteristics that are important moderators within the context of the hypothesized model. Second, the nonsignificant causal paths could be due to sampling error: obtained path coefficients, because they are based on imperfect measures, are expected to vary across

samples. Thus, the obtained coefficients may be underestimates of the true relationship between these variables within the context of the Bedeian and Armenakis model.

We could have deleted one or several of these paths and retested the fit of a restricted model. This procedure, referred to as theory trimming (Pedhazur 1982), is an empirically-based procedure of model construction that capitalizes on sample-specific covariation. Since the purpose of this investigation was to constructively replicate the Bedeian and Armenakis model, attempts to modify the hypothesized model in a post hoc fashion could have led to spurious findings. A scientifically more acceptable approach would be for future investigators to specify different a priori models that draw on sound theoretical rationale and then collect data to test each of them. However, the improvement in fit made possible by the use of a better model is, in practical terms, quite small. Considered in the context of each sample, the incremental fit indices for the public ($\Delta_{nm} = 0.990$), government ($\Delta_{nm} = 0.997$), and industrial ($\Delta_{nm} = 0.994$) accountants indicate virtually perfect fit. Even in the case of Jackson's hospital employess ($\Delta_{nm} = 0.861$), the improvement ($1.0 - .861 = .139$) that a better model might yield is relatively insignificant from a practical viewpoint.

We minimized concerns related to sample-specific covariation (e.g., Schmidt & Hunter, 1977) using a total sample of more than 1000 subjects. Nevertheless, caveats germane to causal modeling should be noted. First, the fact that a hypothesized model is consistent with the obtained data does not indicate unequivocal support, as the observed data may well also support other network orderings. This concern is minor in the present instance as the proposed model was based on reasonably sound a priori theoretical considerations (Bedeian & Armenakis, 1981), and it yielded both statistically as well as practically significant results. A second concern is the appropriateness of the hypothesized causal paths — more specifically, the self-containment of the structural equations explicit in the model. A structural equation is said to be self-contained when all relevant endogenous variable determinants are measured (James, Mulaik, & Brett, 1982). Given practical constraints, we did not include all known determinants of job-related tension, job satisfaction, and propensity to terminate employment in the present analysis. The consequence of these omissions is a potentially biased estimate of the structural parameters relating the endogenous and exogenous variables in the models investigated. The effect that bias will have on the usefulness of the hypothesized model cannot be determined until data are collected on additional unmeasured variables.

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AN EMPIRICAL DERIVATION OF THE DIMENSIONS ALONG WHICH CHARACTERISTICS OF JOBS ARE PERCEIVED

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Subjects' judgments about the similarity of 20 stimulus jobs were analyzed with a metric multidimensional scaling algorithm (Common Space Analysis) in order to identify the dimensions along which individuals perceive characteristics of jobs. On the basis of data from other subjects who rated the stimulus jobs on a variety of specified characteristics a priori, these dimensions were labeled job complexity, serves the public, and physical demand. Implications of the findings for research on job design are discussed.

Many empirical studies have employed measures of job or task characteristics based on incumbents' perceptions (Aldag, Barr, & Brief, 1981; Pierce & Dunham, 1976; Roberts & Glick, 1981). Almost all such studies have measured job or task characteristics with such currently popular measures as the Job Diagnostic Survey (JDS) of Hackman and Oldham (1975), the Yale Job Inventory (YJI) of Hackman and Lawler (1971), the Job Characteristics Inventory (JCI) of Sims, Szilagyi, and Keller (1976), and the Requisite Task Attribute (RTA) and Perceived Task Index (PTI) of Turner and Lawrence (1965). Selected other studies (Ganster, 1980; Stone, 1975, 1976, 1979) have used measures similar to those just listed. Not surprisingly, almost all extant measures of perceived job characteristics have their roots in the RTA and PTI; an examination of items in such measures as the JDS, YJI, and JCI reveals their general similarity to items in Turner and Lawrence's measures.

PROBLEMS WITH POPULAR MEASURES OF JOB CHARACTERISTICS

The similarity noted above among existing measures of job characteristics is unfortunate, however, in that Turner and Lawrence (1965) used largely a priori speculation and conceptualization in determining the number and nature

The order of authorship was randomly determined; contributions of authors were equal. An abbreviated version of this paper was presented at the 1982 convention of the American Psychological Association. We thank Peter Schönemann, Donald King, and Howard Weiss for numerous helpful suggestions on the conduct and reporting of the study's results.

of characteristics indexed by the RTA and the PTI. As they noted, their measures resulted from "a search of the literature for useful ideas, a reflective review of our own ideas as students of industrial work, and by the trial and error process of attempting to define and actually measure a wide variety of task attributes" (1965: 19). Although this method of scale development was probably appropriate at the time Turner and Lawrence did their seminal work on job characteristics and worker responses, the method suffers from a basic flaw: it results in measures that index dimensions that may or may not coincide with the dimensions along which individuals generally perceive characteristics of jobs to vary. Put somewhat differently, the dimensions the RTA and PTI index may represent the idiosyncratic way in which Turner and Lawrence viewed jobs more than the way in which people in general view such dimensions. Given the similarity noted in the preceding paragraph of virtually all existing measures of perceived job characteristics to the RTA and the PTI, the characteristics such instruments measure may not correspond very well with the characteristics along which individuals generally perceive jobs.

The problem just noted is but one of many that are connected with existing measures of job characteristics. Pierce and Dunham, for example, argued that "the task dimensions studied in job design research have generally not been guided by any conceptually or empirically developed typology of task design" (1976: 94). In a similarly critical vein, Salancik and Pfeffer noted that "the characterization of jobs . . . is a process which says as much about the researcher as it does about the actual characteristics of such jobs" (1977: 445). In addition, Roberts and Glick lamented the fact that "the appropriateness and comprehensiveness of the four or five perceptual task dimensions assessed by such measures as the JDS and JCI has gone unquestioned" (1981: 210). Finally, on the basis of a comprehensive review of studies employing the JDS and JCI, Aldag, Barr, and Brief (1981) observed: "Regardless of the relative merits of these instruments . . . it is clear that each is based on a restrictive set of assumptions concerning task dimensionality and the specific character of relevant task characteristics" (1981: 429). They further state that the "sole reliance on such indices [as the JDS and JCI] can no longer be justified" and that it may be the case that a "radical departure from the Turner and Lawrence (1965) paradigm on which these instruments were constructed will produce a greater level of understanding of employees' reactions to the contents of their jobs than have current treatments of task characteristics. Use of only available perceived task characteristics instruments will not open up these potentially fruitful avenues of investigation" (1981: 428).

We fully agree with such arguments. Consequently, the major purpose of the present study was to empirically determine the dimensions along which individuals actually perceive job characteristics (i.e., work activities of job incumbents). As is indicated in our methods section, we derived a set of such dimensions using a scaling method — multidimensional scaling — that makes no *a priori* assumptions whatsoever about the number and nature of

dimensions along which individuals perceive stimuli (e.g., jobs) to vary. Rather, the technique uses subjects' judgments about the similarity of stimuli as a basis for generating a geometric representation (or scaling solution) dealing with the relatedness of stimuli. In conjunction with other information about the same stimuli, the information the scaling solution provides can be used to identify the dimensions along which subjects perceive stimuli to vary.

The dimensions recovered from a multidimensional scaling procedure appear to have at least two highly important advantages over the *a priori* dimensions associated with instruments like the RTA, PTI, JDS, JCI, and YJI: (1) Since nothing constrains the dimensionality of subjects' perceptions of job characteristics, investigators can identify the dimensions along which jobs are actually perceived to vary, and may as a result, be able to avert many of the measurement problems noted by Pierce and Dunham (1976), Salancik and Pfeffer (1977), Roberts and Glick (1981), Aldag and his colleagues (1981), and others. (2) Measures based upon the dimensions identified by a multidimensional scaling procedure may improve our capacity to predict such outcomes as job satisfaction, job involvement, withdrawal propensity, absenteeism, and turnover because, to the extent that existing measures of job characteristics fail to accurately reflect the dimensions along which individuals actually perceive jobs to vary, the utility of such measures for predicting variables such characteristics are thought to affect may suffer. Stated somewhat differently, the predictive validity of a measure of job characteristics derived through multidimensional scaling should be greater than that of measures involving dimensions derived *a priori*.

We believe that better measures of perceived job characteristics can only be developed through (1) determining dimensions along which individuals actually perceive job characteristics to vary, and (2) subsequently constructing measures to index those dimensions. The continued use of extant measures that employ *a priori* dimensions will not lead to such progress (cf. Aldag et al., 1981). The present study, therefore, identifies the dimensions along which individuals perceive characteristics of a heterogeneous set of jobs, and also offers a basis for suggesting which dimensions should be considered in measures of job characteristics used in future studies.

INDIVIDUAL DIFFERENCE VARIABLES AND PERCEPTIONS OF JOBS

Previous research on the way in which individuals perceive various types of stimuli suggests that several individual difference variables might influence the dimensionality of their perceptions of job characteristics. Research has, for example, shown that variables like field independence of the perceiver (Stone, 1979), degree of political conservatism of the perceiver (Abelson, 1954), cognitive complexity of the perceiver (Leventhal, 1957), and the level of contact or experience the perceiver has had with the stimuli being perceived (Imada, 1982) influence perceptions of various types of stimuli. Since individual difference variables may have an important influence on the number or nature of individuals' perceptions of job characteristics,

a secondary purpose of this study was to determine whether scaling solutions based upon judgments of inter-job similarity would differ for subgroups formed on the basis of individuals' standing on field independence, cognitive complexity, and work experience. We hypothesized that such solutions would have higher dimensionality for subgroups that were (1) high (as opposed to low) on cognitive complexity, (2) field independent (as opposed to dependent), and (3) experienced (as opposed to inexperienced) with work.

Before turning to this study's methods, we wish to note that although several studies concerned with scaling job titles (Burton, 1972; Dubin, Porter, Stone, & Champoux, 1974) have used multidimensional scaling procedures, no previous research involved scaling jobs on the basis of the work activities of job incumbents or their job or task characteristics. In Burton's study, subjects rated a set of job titles in terms of their similarity with no specific constraint that similarity judgments be based on job or task characteristics connected to work activity: consequently, the study yielded information that is of little use for developing measures of job or task characteristics based on work activity. The study by Dubin and his colleagues assessed the congruence of multidimensional scaling solutions based upon data supplied by job incumbents, their peers, and their supervisors. Unfortunately, however, they based indices of interjob similarity (i.e., interjob distances) on subjects' ratings of individual jobs on a number of job characteristics that were specified *a priori*; as a result, subjects were not free to employ their own perceptual dimensions. The findings of the Dubin et al. study, therefore, deal more with how similarly individuals in various organizational roles rate a set of jobs than with the number and nature of dimensions along which individuals' perceptions of job characteristics actually vary. Thus, the present study is the first of its type, that is, the first to identify the dimensions along which individuals perceive the characteristics of jobs to differ.

METHODS

Overview

In order to empirically derive and tentatively label or identify a set of dimensions of perceived job characteristics, we employed three sets of subjects. Members of the first set provided data on their familiarity with a diverse set of stimulus jobs in the study's pilot phase. Then, in the main data collection phase of the study, subjects in the second set both (1) judged the similarity — in terms of the work activities of incumbents performing the jobs — of pairs of jobs, and (2) rated jobs on a large set of job characteristics that were specified *a priori*. After subjecting the resultant similarity data to a metric multidimensional scaling analysis, we interpreted the results of the analysis using data from the ratings of jobs on the *a priori* specified characteristics.

Finally, in the study's supplementary data collection phase, a third set of subjects rated the stimulus jobs on a set of characteristics that were either

(1) suggested by the scaling solutions derived from the study's main phase, or (2) not measured adequately in the main phase.¹

Since the ratings of jobs (main and supplementary phases) followed the collection of job characteristics based similarity data, subjects' ratings of stimulus jobs on various characteristics or attributes could not have influenced the perceptual dimensions revealed by the multidimensional scaling analysis. The sole function of the job characteristics ratings in the main and supplementary data collection phases was to aid in the identification or labeling of dimensions recovered by the multidimensional scaling analysis.

Subjects

Pilot data collection phase. Eighty-eight undergraduate management students were subjects in the pilot phase of data collection. Since their demographic characteristics were virtually identical to those of the group who participated in the main data collection phase of the study, we offer no demographic data on the pilot study subjects.

Main data collection phase. One hundred twenty-nine management students (74 men, 55 women) were subjects in the main data collection phase of this study. These subjects had an average of 15.8 (s.d. = 17.8) months of full-time work experience and an average of 23.2 (s.d. = 19.2) months of part-time work experience; 38.6 percent were currently employed part-time; 1.3 percent were currently employed full-time; and 59.5 percent were unemployed. On the average, subjects had held a total of 4.3 (s.d. = 1.66) jobs each; these jobs differed as to whether they were supervisory (33.3%) or nonsupervisory (66.7%), and also differed with respect to collar-color status: 30.8 percent were blue-collar, 47.4 percent were white-collar, and 21.8 percent were service jobs of unclassifiable collar color.

Subjects reported current and past jobs representing 98 different job titles that fell into the occupational classes designated by the Institute for Social Research (Robinson, Athanasiou, & Head, 1969: 344-356) as follows: class I, professional, technical, and kindred workers, had 26; classes IIA, IIIB, and IIC combined, managers, officials, and proprietors, had 12; class III, clerical and kindred workers, had 11; class IV, sales workers, had 1; class V, craftsmen, foremen, and kindred workers, had 17; class VI, operatives and kindred workers, had 24; class X, farm laborers and foremen, had 2; class XI, laborers (except farm and mine), had 7.

Supplementary data collection phase. A total of 127 subjects participated in a supplementary data collection session (described later in this paper under Procedures). As we drew these subjects from the same population as those who participated in the main data collection sessions, the demographic characteristics of subjects in the two groups were probably highly similar. However, demographic data were not collected from subjects who provided the supplementary data.

¹See Gueutal (1980) for details related to these methods.

Job Title Stimulus Set

The stimulus set to which subjects were exposed included the following job titles: accountant, actor, assembly-line foreman, bank teller, cashier, construction laborer, elementary school teacher, file clerk, fire fighter, flight attendant, janitor, lawyer, machine operator, mail carrier, retail store manager, short order cook, tailor, taxi driver, telephone operator, and waiter/waitress. We selected these stimulus jobs from a larger set of job titles ($n = 52$) drawn from the jobs listed in the *Dictionary of Occupational Titles* (1965), reducing the larger set to the final one ($n = 20$) we used in collecting similarity data through a two-step process. The first step involved the group of pilot study subjects ($n = 88$), mentioned earlier in the Methods section, who did not overlap with individuals who served as subjects in the main or supplementary data collection phases of this research. Pilot study subjects rated all jobs in the larger set in terms of their familiarity with the work activities of incumbents performing the various jobs. The familiarity ratings ranged from not at all familiar (scored 1) through moderately familiar (scored 3) to totally familiar (scored 5). We selected only jobs with average familiarity ratings equal to or greater than 3.0 for possible subsequent inclusion in the final set of stimulus jobs. We then further reduced the number of selected jobs in order to obtain a set of stimulus jobs that would be (1) heterogeneous with respect to such criteria as job incumbent's collar color, employment sector, job status, and other variables, and (2) generally representative of civilian jobs.

The extent to which the stimulus set was representative can be assessed by comparing the properties of jobs that it contains with properties of all civilian jobs in the United States (cf. United States Bureau of Labor Statistics figures for 1970 and 1979; and Glueck, 1978). For collar-color, the breakdown for stimulus jobs and all U.S. jobs (shown in parentheses) is: white collar, 45.0% (49.9%); blue-collar, 30% (33.4%); and service with unclassifiable collar color, 25% (16.7%). Percentages for type of employment are production, 30% (33.3%); and service, 70% (66.7%). Percentages for employment sector are: public sector, 15% (17%); and private sector, 85% (83%). Thus, job titles in the stimulus set appear to be reasonably representative of jobs in general; we wish to emphasize, however, that we can not validly make general claims of representativeness with a stimulus set of only 20 jobs.

The end-product of the two step process described earlier in this section was the set of 20 stimulus job titles that we subsequently used to form stimulus pairs for our measure of job similarity, described in the next subsection. The same set of job titles also provided the stimuli for the job characteristics ratings collected in the main and supplementary data collection phases of this research.

Measures

Job familiarity measure. Pilot study subjects rated a total of 52 jobs in terms of their familiarity with work activities of incumbents in the various

jobs. The familiarity ratings ranged from not at all familiar (scored 1) through moderately familiar (scored 3) to totally familiar (scored 5).²

Job similarity measure. Our measure of job similarity listed 200 pairs of job titles derived from the 20 titles contained in the stimulus set; 190 pairs represented all possible unique combinations of jobs in the stimulus set and 10 pairs were repeated to allow for the assessment of the reliability of judgments indexed by the measure. Subjects in the main data collection phase of this study rated each pair of jobs in terms of "the similarity of work activities of incumbents performing the job" on a 6-point scale with anchors ranging from not at all similar (scored 1) to almost completely similar (scored 6). For each subject, we computed a reliability estimate for judgments so indexed by correlating the similarity ratings for the 10 repeated job title pairs. The average correlation (based on Fisher's Z transformed values) was .76 (s.d. = .18).

Main job characteristics measure. This measure, consisting of 55 items, was completed by subjects who participated in the main data collection phase of the study. Many items in the measure are slightly modified versions of items found in such standard measures as the JCI, JDS, YJI, RTA, and PTI; we modified items to make them applicable to jobs that were rated — but not actually held — by the rater.

Other items in this measure index job characteristics or attributes that the standard measures do not deal with. Table 2 lists all items constituting this measure.

Other measures used in the main data collection phase. Subjects who participated in the main data collection phase also completed three other measures: (1) a measure of field independence — the Group Embedded Figures Test (Witkin, Oltman, Raskin, & Karp, 1971); (2) a measure of cognitive complexity — a modified version of the Role Construct Repertory Test (Bieri et al., 1966); and (3) a measure of work history designed to elicit information about the demographic characteristics and work histories of subjects. The purpose of collecting data associated with these three measures was to assess the effect the corresponding individual difference variables had on configurations derived from the multidimensional scaling procedure.

Supplementary job characteristics measure. Subjects who participated in the supplementary data collection phase completed a measure having eight items. These items tapped certain job characteristics suggested by the results of multidimensional scaling solutions derived from data associated with the study's main data collection phase. Table 2 lists these items.

Procedures

Subjects who participated in the pilot study phase of this study completed the job familiarity measure in group sessions lasting about 10 minutes each.

We collected data for the main phase of the study in two 90 minute sessions separated by a time interval of one week. In the first session, sub-

²A list of these jobs and their familiarity scores can be obtained from the authors.

jects completed job similarity and work history measures. In the second session, they completed (1) the main job characteristics measure for each member of a randomly selected set of 7 stimulus job titles, (2) the Group Embedded Figures Test, and (3) the modified Role Construct Repertory Test. We had subjects rate only 7 of the 20 stimulus jobs during the second session in order to limit the length of the session and thus avert subject fatigue and concomitant rating errors (unreliability). After completing the various measures, subjects were fully debriefed.

After we had derived scaling solutions based on data from the main phase of this study, we collected data from subjects participating in the supplementary data collection phase; they completed the supplementary job characteristics measure in group sessions lasting about 10 minutes each.

Analyses

Multidimensional scaling. We scaled data from our job similarity measure in accord with the Horan (1969) scaling model using the Common Space Analysis (COSPA) algorithm developed by Schönemann, James, and Carter (1978, 1979). This MDS algorithm "recovers" the dimensions along which subjects perceive stimuli (e.g., jobs) to vary. COSPA is superior to other extant MDS algorithms in that it provides its users with two test indices — a common space index and a diagonality index. The common space index allows users to infer the degree to which subjects perceive stimuli in a common m -dimensional space. The algorithm includes both per-subject and across-subjects tests of the common space assumption. The diagonality index allows users to assess whether or not the multidimensional scaling solution is rotationally invariant, on per-subject and across-subject bases.³

The multidimensional scaling were conducted in three phases. In the first phase, we randomly divided interjob similarity data from all subjects ($n = 129$) into three subsamples of equal size, and analyzed each subsample's data with the COSPA algorithm. We then compared resultant configurations by correlating the positions (coordinates) of jobs on each of the dimensions for one subsample with the positions of jobs on each of the dimensions for the other subsamples in order to determine the stability or replicability of the multidimensional scaling solutions. To the extent that configurations for the three subsamples were similar, we viewed the multidimensional scaling results as stable.

In the second phase of the analysis, we divided the overall sample ($n = 129$) into three subsamples of equal size on the basis of the degree to which subjects differed on a given individual difference variable, analyzed each subsample's similarity data with the COSPA algorithm, and then compared the resulting multidimensional scaling solutions for similarity using the correlational procedure noted in the preceding paragraph. The degree to which scalings were invariant across subgroups based on individual difference variables provided suggestive evidence that the same variable did not influence the way stimuli are perceived.

³For additional information on these test indices see Schönemann et al. (1978, 1979).

Variables used as a basis for these trichotomizations of the sample were field independence (indexed by the Group Embedded Figures Test), cognitive complexity (measured by the Role Construct Repertory Test), and work experience (assessed by the work history measure); we performed analyses for each of these three individual variables separately.

In the third phase of the analysis, which was contingent upon the first phase showing solution stability and the second phase showing no individual difference-based effects, we used the data for 100 subjects — the maximum number that the COSPA algorithm can use — to sequentially derive the best multidimensional scaling solution. The sequential process involved examining multidimensional scaling configurations for solutions of one, two, three, and four dimensions and considering these solutions in terms of two criteria: (1) the change in percentage of variance accounted for between a given solution (having m dimensions) and a solution of higher dimensionality (having $m + 1$ dimensions), and (2) the degree to which a stable dimension from a given solution remained intact in a solution of higher dimensionality. (These criteria are similar to those employed in determining the optimal number of factors to extract from a covariance structure.)

To reduce the size of the sample from 129 to the 100 that the COSPA algorithm can use at any one time, we excluded data from the 29 subjects who least fit the common space and diagonality assumptions of the scaling model; however, the scaling solution for the 100 best fit subjects was virtually identical to scaling solutions based on data from 100 subjects who were randomly selected from the overall ($n = 129$) sample (cf. Gueutal, 1980).

Interpretation of scaling solution. In order to interpret — that is, label or identify — the perceptual dimensions resulting from our multidimensional scaling analysis, we correlated the job-title scaling coordinates of the optimal solution employing the 100 subjects with ratings (averaged across all raters) of the stimulus jobs on our main and supplementary job characteristics measures. We assumed that high correlations between characteristics indexed by the job characteristics measures and the job-title scaling coordinates that were based on multidimensional scaling would provide clues as to the characteristics subjects employed in making judgments about the similarity of jobs in the stimulus set.

RESULTS

Multidimensional Scaling Analyses

Replicability of scaling solutions. Table 1 shows correlations between job-title scaling coordinates for the three randomly selected subsamples, reported, in the interest of brevity, for only the three-dimensional solution.⁴ The average of the correlation coefficients in Table 1 is .88, and the range of the same

⁴The authors will provide interested readers with the correlations for solutions of differing dimensionality.

TABLE 1
Correlations^a Between the Job Title Scaling Coordinates
for the Three Subsamples

Scaling Dimension	Correlations for Subsamples ^b		
	1 and 2	1 and 3	2 and 3
I	.93	.91	.87
II	.87	.87	.87
III	.87	.91	.78

^aTabled values represent correlations between the multidimensional scaling coordinates for the 20 stimulus jobs.

^bAll correlations are statistically significant ($p < .001$); all significance tests were two-tailed.

coefficients is .78 to .97, indicating a high degree of convergence among the three scaling solutions, or highly replicable results.

Individual difference-based analyses. Multidimensional scaling analyses of data from subsamples created by trichotomizing the total sample ($n = 129$) on the basis of subjects' standings on given individual difference variables revealed that the same variables had no discernible impact on the scaling solutions. In the interest of brevity, we do not report the relevant results.

Multidimensional scaling of combined sample's data. The combined findings of (1) high replicability across the three subsamples, and (2) no effect of individual difference variables on the scaling solutions suggested that a multidimensional scaling analysis using data from the combined ($n = 100$) sample would be appropriate. This analysis showed that solutions having one, two, three, and four dimensions, led to the explanation, respectively, of 18.9 percent, 34.0 percent, 43.3 percent, and 48.8 percent of the variance in the original set of job similarity data. A two-dimensional solution accounted for a substantially higher percentage of variance than did a one-dimensional solution, and there was a further, substantial increment in explained variance in going to a three-dimensional solution. However, since adding a fourth dimension resulted in only a small increase in explained variance, we concluded that a three-dimensional solution was optimal for the study's data.

For the three-dimensional solution involving the combined sample, the null hypothesis for the common space test was rejected in 99 of 100 instances ($p < .001$), and the rotational invariance hypothesis was rejected in 51 of 100 cases ($p < .001$). These results suggested that, although virtually all subjects perceived the stimulus jobs in a common space, the scaling solutions were rotationally invariant for only about one-half of the subjects.

Figure 1 presents a geometric representation of the three-dimensional solution for the combined sample. Figure 2 shows a mapping of the stimulus jobs in terms of their coordinates along dimensions I and II; and Figure 3 presents a mapping of the same jobs along dimensions I and III. Inspecting these figures permitted us to assign tentative labels or names to the three dimensions.

FIGURE 1
Placement of Stimulus Jobs for the Three-Dimensional Scaling Solution

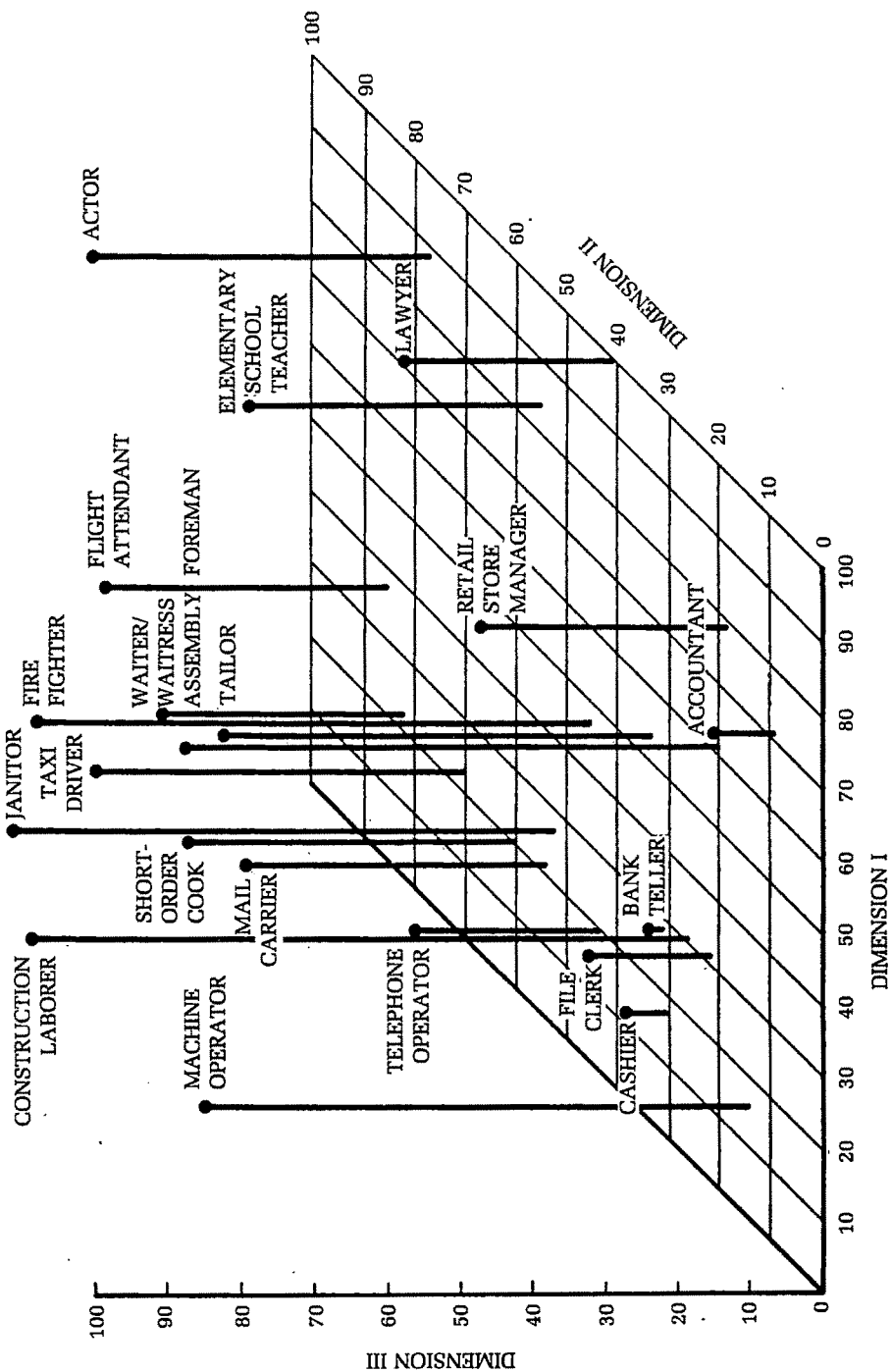
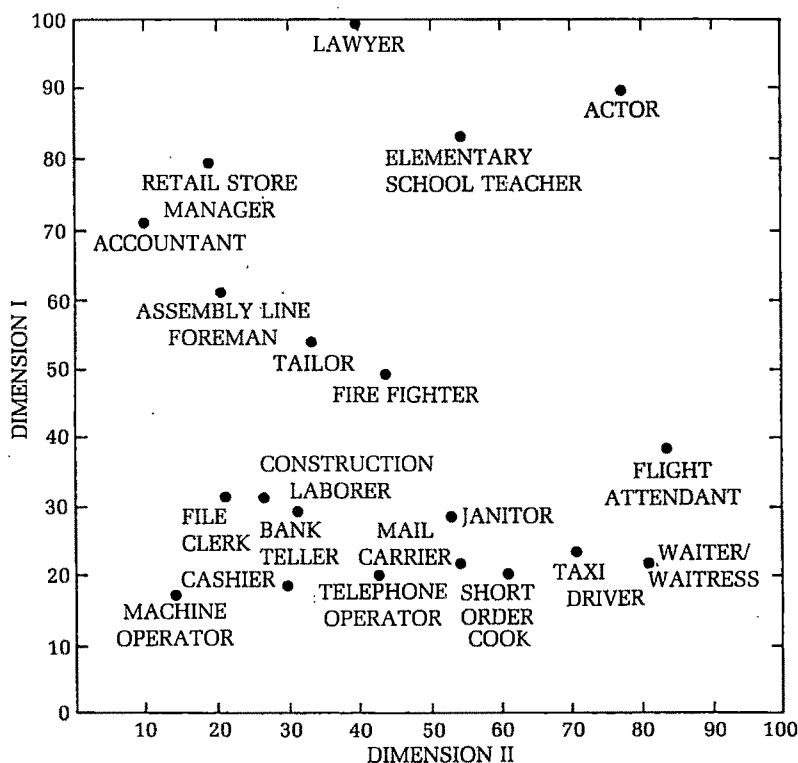


FIGURE 2
Placement of Stimulus Jobs Along Dimensions I and II
of the Three-Dimensional Scaling Solution

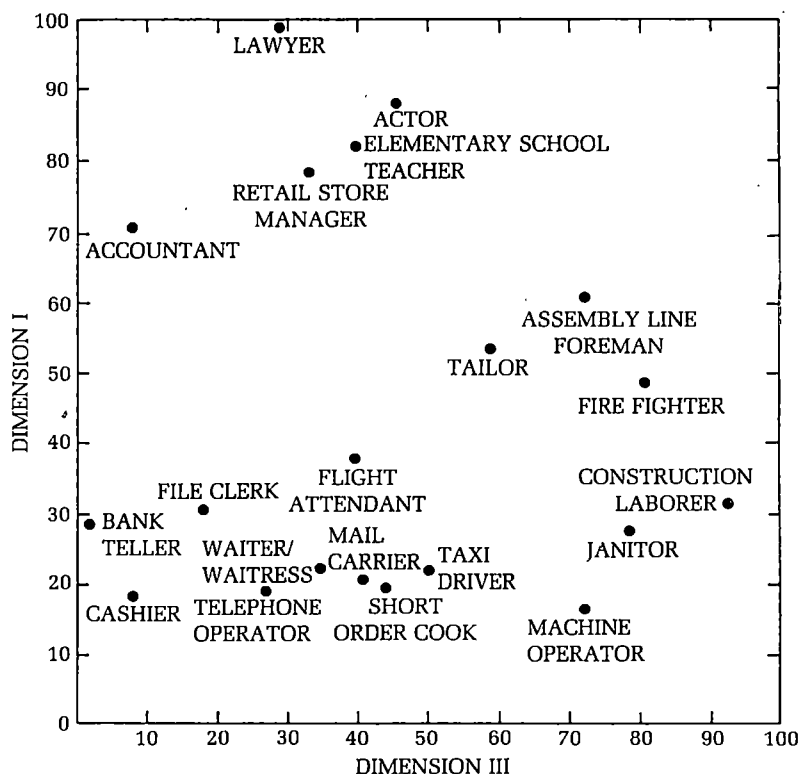


Naming of dimensions generated by multidimensional scaling. Our examination of dimension I of the scaling solution led us to speculate that it represents a dimension that might be labeled job complexity. However, other observers of the same scaling solution might assign different names to this dimension. Similarly, the labels we assigned to dimensions II and III might differ from those that others would assign to these dimensions. This problem of subjectivity in naming the dimensions resulting from a multidimensional scaling analysis is similar to that encountered when different individuals are asked to name the factors that result from a factor analysis.

In order to avoid such subjectivity, we based the labels assigned to the dimensions upon results produced by correlating the job title scaling coordinates with the averaged ratings of jobs on the characteristics measured by the main and supplementary job characteristics measures. Table 2 shows these correlations.

The job title scaling coordinates of the stimulus jobs for dimension I correlated highly with rated levels of skill variety ($r = .92$), complexity of job ($r = .91$), job requires a great deal of reasoning ($r = .90$), brings work home ($r = .95$), high

FIGURE 3
Placement of Stimulus Jobs Along Dimensions I and III
of the Three-Dimensional Scaling Solution



status job ($r = .93$), highly desirable job ($r = .92$), and the computed values of linear and multiplicative (combinatorial) versions of the motivating potential scores of jobs (respective r values of .90 and 93); all such correlations were statistically significant ($p < .001$). On the basis of these findings, we considered naming dimension I of the scaling solution job scope, job complexity, or professionalism. However, in the interest of simplicity, we subsequently refer to this dimension as job complexity.

The scaling coordinates for job titles of the stimulus jobs for dimension II showed their highest levels of association with the rated characteristics of optional interaction ($r = .45$), travels as part of work ($r = .43$), incumbent provides a service ($r = .49$), incumbent entertains the public ($r = .60$), incumbent interacts with and serves the public ($r = .50$), and incumbent has a steady workload ($r = -.66$); dimension II appeared to be a continuum along which individuals discriminated between roving service providers with variable workloads and fixed-location production workers with steady workloads. In the interest of brevity, we hereafter refer to this dimension as serves the public rather than as interacts with and serves the public, another possibility.

TABLE 2
Correlations between Job-Title Scaling Coordinates
and Items in the Measures of Job Characteristics
and Other Job Attributes

Measured Characteristic or Attribute	Scaling Solution's Dimension ^a		
	I	II	III
Traditionally measured job characteristics^b			
Autonomy	.81***	.29	.09
Dealing with others	.59**	.19	.00
Extrinsic feedback	.38	.06	.19
Intrinsic feedback	.57	.13	.11
Optional interaction	.11	.45*	.02
Required interaction	.68***	-.02	-.06
Skill variety	.92***	-.25	-.01
Task identity	.04	.35	-.23
Task significance	.41*	-.05	-.32
Motivating potential score (linear combination)	.90***	.04	-.03
Motivating potential score (multiplicative combination)	.93***	.10	.01
Other job characteristics^b			
Technical training required	.80***	-.31	-.03
High degree of education required	.88***	-.21	-.35
Verbal skills required	.73***	.18	-.45*
Complexity of job	.91***	-.30	-.04
High degree of information processing	.71***	-.34	-.62**
Physical activity and movement in job	-.12	.34	.71***
Physical strength required	-.14	.07	.83***
High incumbent health hazards	-.16	.10	.74***
High risk to others	.15	.13	.54**
Cleanliness of job	-.34	.05	.83***
Responsibility for equipment	-.18	-.25	.74***
Responsibility for large amounts of money	.02	-.24	-.67***
Responsibility for well-being of others	.36	.25	.23
Job is of critical importance to others	.18	-.20	-.06
Job requires a great deal of reasoning	.90***	-.20	-.36
Flexibility of work schedule	.58**	.05	.00
Brings work home	.95***	-.11	-.19
Travels as part of work	.35	.43*	.11
Changes work location during workday	-.01	.17	-.11
Works indoors	.14	-.29	-.47*



TABLE 2 (continued)

Measured Characteristic or Attribute	Scaling Solution's Dimension ^a		
	I	II	III
Other job attributes or outcomes^b			
Paid on a salaried basis	.71***	-.14	-.18
Paid on a commission basis	.42*	.15	-.03
Paid on an hourly basis	-.84***	-.07	.11
High paying job	.81***	-.25	-.02
White-collar job	.79***	-.24	-.54*
Private (vs. public) sector job	-.10	-.11	.00
Incumbent provides a service	.03	.49*	-.46*
Incumbent produces a product	.02	-.25	.49*
Supervisory job	.66***	-.34	.11
High status job	.93***	-.12	-.22
Highly desirable job	.92***	-.07	-.25
Highly satisfying job	.87***	.01	-.06
Incumbent is self-employed	.57**	-.06	.05
Other job characteristics^c			
Entertains the public	.47*	.60**	-.36
Interacts with and serves the public	-.04	.50*	-.43*
Interacts primarily with the public	.03	.43*	-.60**
Interacts primarily with other organizational members	.21	-.34	.40*
Interacts primarily with co-workers, and interacts with public in a professional capacity	.59**	-.46	.20
Highly motivating job	.82***	.14	-.02
Incumbent has a steady workload	.09	-.66***	.13
Great amount of physical strength required	-.10	.16	.81***

^aAll significance tests were two-tailed and based upon a sample size of 20.

^bMain job characteristics measures

^cSupplementary job characteristics measures

* $p < .05$

** $p < .01$

*** $p < .001$

The job-title scaling coordinates for dimension III correlated most strongly with cleanliness of job ($r = .83$), physical strength required ($r = .83$), high incumbent health hazards ($r = .74$), responsibility for equipment ($r = .74$), and physical activity, movement, in the job ($r = .71$); all these correlation coefficients were statistically significant ($p < .001$). As it seemed that subjects used dimension III to distinguish between jobs that were physically non-taxing, clean,

and safe and those that were strenuous, dirty, and hazardous, we named this dimension physical demand.

DISCUSSION

Summary and General Implications

The present study's analyses revealed that (1) the solutions produced by multidimensional scaling analysis were highly stable across three randomly selected subsamples, (2) the measured individual difference variables did not influence the manner in which subjects perceived jobs, (3) three dimensions accounted for a substantial proportion of the variance in the original job similarity data, and (4) these three dimensions had moderate to strong levels of correlation with ratings of jobs on a number of *a priori* specified job characteristics. These correlations suggested that we label the dimensions job complexity, serves the public, and physical demand. Several points or issues related to these findings merit consideration.

First, the finding that subjects perceived jobs along a job complexity dimension that subsumed virtually all of the job characteristics measured by instruments like the JDS, JCI, and YJI suggested that such instruments may measure aspects of jobs that individuals do not use independently in perceiving similarities or differences in jobs. It seems that individuals do not view jobs as having certain levels of variety, autonomy, task significance, and so forth, but instead see jobs in terms of a gestalt or summary dimension that might be labeled job complexity. This finding is consistent with the view that individuals process information about stimuli in such a way as to avoid cognitive strain (Payne, 1976). It is also consistent with the results of several factor-analytic studies of measures like the JDS and the JCI (Dunham, 1976; Sekaran & Trafton, 1978); in these studies, factor analyses of JDS or JCI data yielded a single factor — not the five or six *a priori* factors that the developers of these measures (Hackman & Oldham, 1975; Sims et al., 1976) suggested.

The results of the present study and of the studies of others (e.g., Dunham, 1976) suggest that future users of such instruments as the RTA, YJI, JDS, and JCI may well consider most items in them as measures of a single, homogeneous construct — job complexity. Employing a single index of complexity rather than its constituent parts would do much to simplify future reporting of research related to job design.

We are not advocating that the various individual task characteristics considered by the JDS, JCI, and so forth (e.g., variety, autonomy, and task identity) be neglected in future job design research; rather, we are suggesting that investigators combine these individual characteristics into an overall scale that we have tentatively called job complexity.

Second, the finding that the correlates of dimension I included ratings of whether or not a job is seen as desirable, satisfying, supervisory, high-paying, and status-laden suggests — but does not prove — that individuals may, to some extent, base perceptions about job similarities and differences on implicit

theories that relate job characteristics, or the type of work done, to outcomes — status, satisfaction, high pay, for instance — received for doing that type of work. Whether or not such implicit theories are based upon realistic perceptions about the nature of work and the outcomes generally received for doing it is, however, an issue that future research can and should address.

Third, this study revealed two perceptual dimensions, other than job complexity — serves the public, and physical demand. The standard measures of job characteristics like the JDS, JCI, and YJI do not adequately take these dimensions into account; none of the items in the JCM corresponding to what are commonly called the core characteristics of jobs were correlated with the present study's job-title scaling coordinates for dimension III, and the only significant correlate of dimension II was optional interaction. Since the standard measures of job characteristics fail to index the perceptual dimensions of serves the public and physical demand, their capacity to predict various criteria of interest to organizational behaviorists (e.g., job satisfaction, withdrawal propensity, turnover, job involvement, and job strain) may be limited. Use of measures of job characteristics that include items dealing not only with job complexity, but also with physical demand and serving the public may permit researchers to explain more of the variance in these criteria, because these additional scales may allow research subjects to more fully describe their jobs. Clearly, however, the purpose of this study was not to actually predict such criteria. Therefore, we hope that our study's findings provide the impetus for the research needed to assess the merits of our speculations about increases in criterion-related validity.

A fourth issue worthy of note is that we found no differences in the scaling solutions of the various subgroups formed on the basis of the individual difference variables. We suspect that the absence of such differences is attributable to the relatively limited range of scores for the measures of field independence, cognitive complexity, and work experience. Future research, therefore, should investigate the possibility of these and other individual difference variables influencing the way in which jobs are perceived.

Methodological Issues and Research Needs

Several points related to the external validity of our findings deserve comment. First, subjects in this study judged the degree of similarity (in terms of the work activities of incumbents performing the jobs) of all possible pairs of 20 stimulus job titles. The argument that the present study's results reflect how individuals perceive jobs in general, not their own jobs, may therefore arise. The merits of the same argument can be considered in the light of the findings of a number of previous studies having to do with jobs and their characteristics. The relevant literature contains multiple references, by job incumbents describing their own jobs, to "job characteristics" that are reflective of the "dimensions" recovered in this study (Chinoy, 1965; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Kornhauser, 1965; Terkel, 1972; Walker & Guest, 1952). These studies employed a wide variety of data collection strategies, including unstructured and semistructured

interviewing. It is likely that subjects of studies employing unstructured interviews used dimensions they viewed as relevant in describing their own jobs, and since there is substantial overlap between these dimensions and those recovered in the present study, it seems unlikely that our dimensions differ markedly from those that individuals use in perceiving their own jobs. We feel that the procedures — judgments of job similarity — used in our study to evoke perceived dimensions of job characteristics pose no serious threat to the external validity of our findings. However, further research that assesses the merits of our reasoning is needed; again, we hope that the results of this study serve to stimulate such research.

A second issue related to external validity is the representativeness of jobs included in our stimulus set. As noted in our Methods section, we selected the jobs that constitute this set so as to approximate criteria of (1) heterogeneity on several dimensions (e.g. collar color and employment sector), and (2) representativeness of civilian jobs. Although we were able to provide some suggestive evidence as to how representative jobs in our stimulus set were, generalization of the job dimensions suggested by multidimensional scaling and correlational analyses is an issue that future empirical research must address. Such research should employ samples of stimulus jobs that differ from those we used.

A third external validity issue concerns the types of items that constituted our main and supplementary job characteristics measures. These items tapped both (1) a number of characteristics that have generally appeared in measures like the JDS and JCI, and (2) a number of characteristics that these standard instruments have not indexed adequately. We used correlations between job-title scaling coordinates and mean scores of jobs on the items to tentatively label the dimensions recovered by the multidimensional scaling analysis. Given this procedure, both our own perceptions about what the scaling solution suggested and the job characteristics included in our measures constrained our choice of labels. It is possible, therefore, that a different set of measured job characteristics could lead to changes in the labels we chose, and it is also possible that if other investigators were to inspect our scaling solutions, they might arrive at labels for the three recovered dimensions that might better reflect subjects' perceptual dimensions. Future empirical studies should address these possibilities.

A fourth external validity issue concerns the nature of our sample — undergraduate and graduate students of management with varied lengths and types of work experience. Skeptics may question whether scalings derived from job similarity judgments provided by such subjects would be consistent with scalings derived from judgments made by full-time workers. We have three comments on this issue: First, the extent to which our results are replicable using different sets of subjects is an empirical question that only future research can adequately address; in the absence of such research, conclusions about generalizability or the lack thereof are unwarranted. Second, even though members of our sample had only modest levels of full- and part-time work experience, we doubt that this impaired their ability to

judge the similarities of work activities connected with pairs of jobs in our stimulus set, because individuals can be reasonably familiar with the work activities of incumbents in jobs that they themselves have not held. Such familiarity can come from the direct observation of people who hold various jobs (e.g., cashiers, bank tellers, elementary school teachers) and exposure to films, books, and other materials that describe work activities of individuals who have such jobs. A person does not have to physically hold a job in order to perceive its general characteristics. Third, even vast exposure to particular jobs in particular organizations may not equip individuals to judge similarities and differences between broadly constituted, heterogeneous sets of jobs; instead, such exposure may only lead to their being knowledgeable about their own jobs. Thus, multidimensional scaling solutions based on data from subjects with high levels of work experience in isolated jobs may yield results that are as prone to external validity questions as are the results of this study. In view of this possibility, we hope that the findings of our study motivate other researchers to study the impact of work experience on the number and the nature of dimensions used by individuals in perceiving characteristics of their jobs.

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VERTICAL INTEGRATION AND CORPORATE STRATEGY

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Proposing a new look at vertical integration and the dimensions that comprise it, this study develops a framework for predicting when firms use make-or-buy decisions. The strategic business units (SBUs) studied made fewer products and services in-house and firms were engaged in fewer stages of processing when demand was highly uncertain than they did when demand was more certain. Internal transfers from upstream or to downstream business units were more numerous when synergies with adjacent SBUs were substantial than when they were not. Some competitive imitation of vertical integration strategies occurred, and firms with high market shares sought higher ownership stakes in stages of processing adjacent to those markets.

Vertical integration involves a variety of decisions concerning whether corporations, through their business units, should provide certain goods or services in-house or purchase them from outsiders instead. Corporations considering vertical integration — one of the first diversification strategies firms consider as they progress from being single-business companies — must make decisions regarding the autonomy of these business units. Most research concerning vertical integration has assumed that savings in the costs of transactions that integration accomplishes supersede autonomy needs of strategic business units (SBUs). According to such an assumption, integrated firms will transfer all of their relevant goods and services to adjacent, in-house business units. However, this paper argues for a dynamic concept of vertical integration in which the key to effective management is understanding when corporate needs for intrafirm cooperation might take precedence over the concerns of autonomous business units; and when the opposite might be true. The theory developed in this study incorporates the forces of competitive settings and corporate (as well as business-level) strategy needs in a suggested framework for appropriate use of vertical integration. Developing this strategy framework introduces several new dimensions that characterize all vertical integration strategies. My intent is to bridge the gap between economic treatments of vertical integration and activities observed in the histories of several industries; the next section briefly sketches the dimensions of this gap.

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REVIEW OF LITERATURE CONCERNING VERTICAL INTEGRATION

Past economic treatments of the complex strategy of vertical integration have not recognized the many ways firms might use make-or-buy decisions effectively. Scholarly treatments of diversification have often skimmed on discussions of vertical integration, and nowhere have trade-offs in using it as a strategy been articulated adequately for managers.¹ Firms should screen vertical expansions with performance criteria as fine as those applied to their other diversification investments. Their ability to do so depends on growth in understanding this strategy.

Vertical integration is a way of increasing a firm's value-added margins for a particular chain of processing from ultraraw materials to ultimate consumers. Past studies (Arrow, 1975; Coase, 1937; Williamson, 1969, 1971, & 1975) have noted integration economies gained from shared facilities, information, or other resources, but not the risks of strategic inflexibility. Adelman (1949), Bork (1954), and Kaserman (1978) recognized the market power conveyed by this strategy, but the analyses they employed in studying it were static. The nature of competition evolves — and as competitive settings change, so will the need for vertical integration. Finally, the distinction drawn in this study between business-level strategy and corporate strategy is one that has not previously been applied to the study of vertical integration. Instead, empirical studies have relied upon industry-level samples (Laffer, 1969; Maddigan, 1979; Pfeffer & Salancik, 1978) rather than on looking at firms and their business units. The conclusions Tucker and Wilder (1977) reached in verifying Stigler's (1951) hypotheses richly illustrated the dangers of relying on highly aggregated samples in analyzing vertical integration. Using COMPUSTAT® data (from multibusiness firms categorized by SIC classifications), they found that industries begin integrated, become less so as they mature, and again become integrated in the end. I believe the opposite progression will emerge from examining the strategies of vertically related SBUs.

The sections that follow put forth a dynamic, contingency approach to vertical integration — a new framework that incorporates the dimensions embodying this strategy and the effects of competition upon them. I suggest that the proper use of vertical integration changes as industries evolve and as firms' emphases upon business sectors change, and argue that the presence (or absence) of certain environmental characteristics should mitigate (or enhance) the use of vertical integration.

A NEW CONCEPT OF VERTICAL INTEGRATION

The terminology developed in this section explicitly recognizes that firms may (1) control vertical relationships without fully owning adjacent

¹A comprehensive bibliography and criticism of these studies may be obtained from the author.

business units, (2) may enjoy benefits of vertical integration without transferring all of their output internally, (3) may (or may not) perform a variety of integrated activities at a particular stage of processing, or (4) may engage in many (or few) stages of processing in the chain of production from ultraraw materials to the final consumer. These possibilities were not aspects of the old image of vertically integrated business units, according to which units were assumed to be 100 percent owned, to be (probably) physically interconnected, and to supply 100 percent of a firm's needs for a particular good or service. This paper suggests instead that firms may adjust the dimensions of their vertical integration strategies to suit competitive or corporate needs; vertical integration need not be the same under all circumstances in order to be effective. Managers can fine-tune their uses of vertical integration in accordance with changes in the forces that this study outlines.

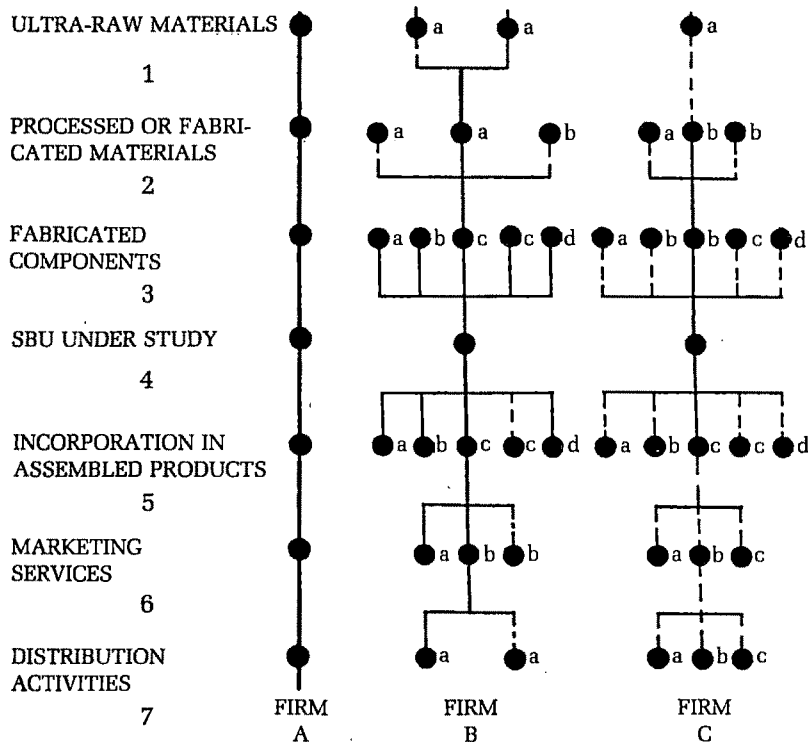
Dimensions of Integration

Stages of integration. The number of steps in the chain of processing which a firm engages in—from ultraraw materials to the final consumer—determines the number of *stages* of integration, as Figure 1 illustrates. In it, firms A and B both engage in seven integrated stages. SBU 4 is the unit under study, and firms A and B each engage in three stages that are upstream of SBU 4 as well as three stages that are downstream. Firm C engages in four integrated stages: two stages are upstream from SBU 4, and one stage is downstream. When firms integrate upstream, economists call this backward integration; when they integrate downstream, they call it forward integration.

Within electronics, some firms engage in several integrated stages connected to the microcomputer business; these firms produce not only microcomputers, but also microprocessor chips and semiconductor memories, photomasks for etching electronic circuits, silicon wafers on which circuits are inscribed, and other substrate materials. Other firms, engaged in only microcomputer assembly operations, participate in just one stage of processing. Within the oil industry, some firms engage in many sequentially adjacent stages of operations, such as seismic exploration, land leasing, pipeline services and refining, as well as in production and in wholesale and retail distribution of gasoline, heating oil, and petrochemical products. Other firms only refine crude oil and ship it to wholesalers or other processors. Under the loose definitions used in previous studies, all of the firms described above would simply have been called vertically integrated; previous studies did not, for instance draw fine distinctions between the lengths of the chains in which processing firms were engaged.

The number of integrated stages matters if firms do not manage complexity well. Thus, firms must address decisions as to stages and breadth (discussed in the following subsection) when they contemplate vertically linked strategies, for each technologically distinct activity may involve several stages of processing. Firms' SBUs may elect to perform some activities in-house, but corporate strategists, who decide whether upstream or downstream investments are warranted, define SBUs' boundaries.

FIGURE 1
Diagram^a of the Dimensions Characterizing
Vertical Integration Strategies



Key: ——— Solid lines indicate intrafirm transfers.
 - - - - Dashed lines indicate external purchases or sales.
 a, b, c Small letters indicate inputs each respective stage of processing adds.

Firm A

The firm is engaged in many stages of integrated activity but adds only one input per stage of processing (it is narrowly integrated). Firm A transfers all of its outputs from stage 1 to stage 2 (from stage 2 to stage 3, etc.) in-house and does not purchase any inputs from (nor sell any outputs to) outsiders. Firm A is fully integrated from stage 1 to stage 7.

Firm B

The firm makes four inputs (a, b, c, and d) at stages 3 and 5, respectively. Firm B purchases some 3c from (and sells some 5c to) outsiders. Firm B is more broadly integrated at stages 3 and 5 than at stages 2 and 6 (because it performs more activities there). Firm B is engaged in many stages of integrated activity, but because the firm purchases some of its requirements from outsiders, its degree of integration for some activities is lower than Firm A's. Firm B is taper integrated.

Firm C

The firm makes only b at stages 3 and 2 and c at stage 5. Firm C is narrowly integrated and engaged in few stages of integrated activity. It purchases some 2b and 3b from (and sells some 5c to) outsiders, making it taper integrated.

Breadth of integration. The way that firms define their SBUs' boundaries vary. The number of activities firms perform in-house at any particular level of the vertical chain determines the *breadth* of integration of the SBU at that level, as Figure 1 indicates; broadly integrated SBUs (like B3, B5, C3, and C5) perform more activities in-house than others do. Broadly integrated SBUs increase a firm's value-added margin substantially at their stage of processing because they make more goods and services in-house, and vertically integrated firms could be broadly integrated at several stages of processing. The old image of vertical integration included no distinction between strategies involving broad (firms B and C) versus narrow (firm A) integration; for example, there would have been no distinction between oil refineries making a multitude of petrochemical products and those making one product from petroleum feedstocks.

Breadth of integration matters because plants that try to produce too many diverse components for a product line may lose opportunities to enjoy scale economies. Overly broad manufacturing policies could also mean that SBUs lose cost advantages of purchasing components or services from more efficient outsiders. Sometimes, corporate strategy needs will impinge on SBUs' freedoms to adjust their breadth or degree of integration (discussed in the next subsection). The managers of an SBU often try to reduce the number of internal transfers it makes from sister units and to enlarge its own sphere of responsibility by making many components it could purchase from others.

Degree of integration. Degree of integration determines the proportion of total output (of a particular component or service) an SBU purchases from (or sells to) its sister SBUs. Fully integrated SBUs transfer 95 percent or more of their requirements for a particular resource in-house. Taper integrated firms purchase more than 5 percent of their requirements for that resource from outsiders (Crandall, 1968a, 1968b). The degree of internal transfers matters because as economic studies have noted, the minimum efficient plant sizes of upstream and downstream activities are rarely the same. Usually, the upstream plant's minimum efficient scale is larger than the downstream plant's. Some portion of the vertical chain is likely to be out of balance due to such differences of scale, so one SBU will either have to engage in transactions with outsiders or let its excess capacity lie fallow. Corporate reward systems encourage (or discourage) efforts to dispose of excess outputs; and there could be reasons (explained later in this paper) for corporate strategy to prefer taper integration over more fully integrated arrangements, particularly when questions of technology are involved.

Excess capacity is costly, yet some firms have concluded that the costs of allowing some portion of one SBU's plant capacity to be idle are justified by the advantages they perceive from fully integrated strategies: economies can be substantial if all of one SBU's capacity can be fully utilized. Reliance upon outsiders for residual supply or demand may be acceptable to these firms. Corporate strategies will suggest which degree of internal transfers is most appropriate at a given time. Depending upon the outside sources available (and other factors discussed in the next major section of this paper),

strategists can encourage the transfer of some, all, or none of the services and materials a business unit might provide its sister, and can change the degree of integration upstream or downstream to suit changing needs to control uncertainty.

Form of integration. Although many firms prefer to own vertically integrated units entirely, they need not own a business unit to control it and enjoy the benefits of vertical relationships, for a variety of other control arrangements are possible. Quasi-integrated firms, for example, share ownership with others, underwrite part of the vertically related firm's capital structure, or possess other stakes in the business unit short of full ownership (Blois, 1972). Hayes and Abernathy (1980) note that Japanese firms use non-equity forms of controlling adjacent firms through long-term contracts — *kanban* ("just-in-time"), for example — and do so with success.

In many environments, firms can obtain leverage over other's assets without owning them fully. Often firms can secure knowledge, services, and materials in this manner with only a small ownership stake. For example, fledgling or undercapitalized firms can hurdle entry barriers by forming joint ventures with established firms (Harrigan, 1985). In brief, firms that exercise control over adjacent business units, but do not own them, are practicing a form of vertical integration as surely as firms that do own their adjacent units, because both firms can treat the outputs or services of these adjacent firms as though they were their own.

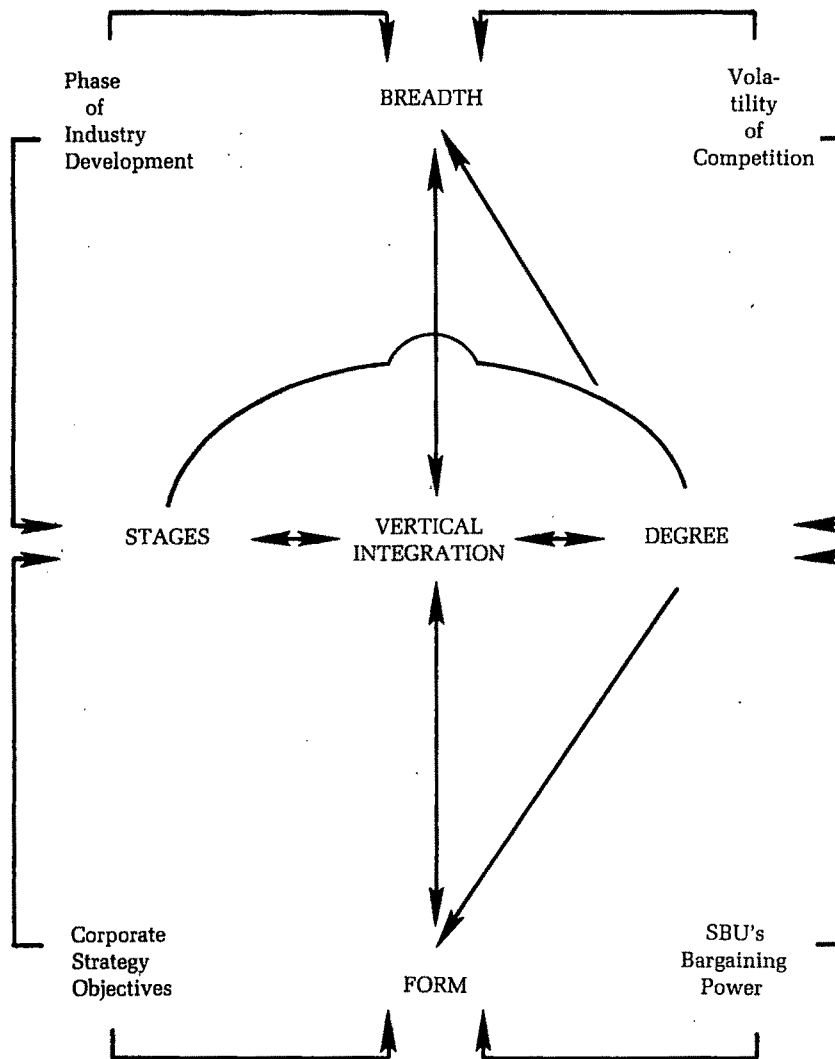
All vertical integration strategies encompass degree, stages, breadth, and form; some combinations of these dimensions occur more frequently than others. The decision to alter one dimension of the strategy will affect the values of the other dimensions. For example, it is likely that firms whose SBUs transfer large proportions of their total outputs internally will be involved in more stages of processing than those with few internal transfers. Forces likely to influence vertical integration will affect all of the strategy's dimensions, although some dimensions will be affected indirectly.

FORCES AFFECTING THE CHOICE OF VERTICAL INTEGRATION STRATEGIES

Firms will adapt the dimensions of vertical integration outlined in the preceding section according to (1) the phase of industry development (sales growth, changes in growth rates), (2) industry volatility (concentration and heights of exit barriers), (3) asymmetries in bargaining position (*vis-à-vis* suppliers, distributors, and customers' or competitors' integration strategies), and (4) firms' strategy objectives. These objectives, which could include desires for technological or market intelligence, as well as for higher value-added margins, might increase the degree, breadth, stages, and form of integration firms undertake. Other conditions (explained in the following sections) might reduce vertical integration along these dimensions.

Figure 2 illustrates the relationship hypothesized to exist between the dimensions of vertical integration strategy and the forces affecting that

FIGURE 2
Forces Tempering Vertical Integration Strategies



strategy. Briefly, although I expect all of these forces to be important to a firm's choosing an appropriate mix of vertical integration, some forces are more important to some dimensions than are others. A firm's corporate strategy objectives and its industry's phase of development will most significantly influence decisions concerning the number of stages to be engaged in. Volatility of competition and an SBU's bargaining power vis-à-vis suppliers or distributors (or customers) will most significantly influence decisions

concerning the degree of internal transfers. Form of ownership used to join adjacent stages will be influenced most significantly by a firm's corporate objectives and an SBU's bargaining power over adjacent parties. Breadth of integration within an SBU will be influenced most significantly by the phase of an industry's development and by the nature of competition therein. The next sections of this paper explain these relationships.

Phase of Industry Development

This study approximated the effects of the phase of an industry's development—whether it was an embryonic or an established industry—by studying sales growth and the degree of uncertainty surrounding sales. Looking at phase of industry development and a firm's corporate strategy objectives together facilitates predicting whether the firm will pioneer the development of new industries or piggy-back on the investments of others who enter early. A major factor influencing this decision is the perceived riskiness of early entry. In particular, uncertainty increases the riskiness of committing to high degrees of internal integration prematurely because highly integrated production processes require most of the outputs from each stage to be absorbed internally (Pfeffer & Salancik, 1978; Thompson, 1967). Uncertainty may be due to sales growth patterns or technological change at some stage in the vertical chain of processing. Demand uncertainty would be particularly great when an industry is young and customers are highly reluctant to try a new product. Demand would also be uncertain if a product's sales were declining for systemic reasons (Harrigan, 1980).

If demand for an SBU's outputs is highly uncertain, the likelihood of insufficient sales volumes (resulting in costly excess capacity) is increased. Therefore, I expect uncertainty to discourage the use of vertical integration, and, in particular, expect variability in demand to increase the riskiness of vertical integration when two or more SBUs have become dependent on each other for product transfers. Thus, the number of integrated stages will be low when growth in industry sales is uncertain. High degrees of vertical integration will also seem especially risky within embryonic industries, or whenever infrastructures are still developing, customer acceptance has been slow, and technology could change demand rapidly as a new industry develops. More integrated activities and stages will appear where demand is increasing at a steady rate, and fewer will appear where demand fluctuates erratically. In particular, the number of stages of integration will be low in the early and late stages of an industry's evolution, particularly if sales change rapidly. Erratic, dramatically deteriorating demand will prove especially costly for integrated firms, and only those firms whose corporate strategies provide for subsidization of multiple, integrated stages of production will support investments in such settings.

Volatility of Competition

If competition is volatile, firms will be reluctant to let SBUs rely heavily upon each other for purchases or sales. Volatile industries increase the riski-

ness of vertical integration because competitors are more likely to use price cutting to fill their plants' capacities in such settings. An industry's volatility, which stems from the presence of certain structural traits and competitive practices (Harrigan, 1983a; Porter, 1980), make the costly overhead associated with vertical integration more difficult to bear. While competition is volatile, SBUs will make less in-house and purchase more from outsiders, thereby shifting some risk to them. When returns are stable, SBUs can safely gear up to produce more in-house or purchase products from sister units.

Analysts often use the height of exit barriers to approximate the stability of an industry's returns because competitors who cannot overcome their exit barriers are unwilling to retire excess capacity, divest facilities, or maintain pricing discipline. This study used exit barriers as proxies for volatile competition, and used a traditional measure of stable industry returns — the concentration ratio — to approximate the force of competitive volatility.

Also, I expect more vertical integration where competition is not fierce and less integration where competition is cutthroat, and expect competition to be more volatile when technology changes rapidly, products are redesigned frequently, and SBUs steal market share from each other in continual rounds of price cutting. Such conditions make vertical integration more costly for firms to sustain, particularly when their SBUs make several customized product models rather than a few standardized product models. Other conditions could increase volatility as well. Competition could erupt into price wars in which suppliers could force component attributes to change (because accelerated product obsolescence may prevent firms from recovering their product development costs). Rivals from dissimilar strategic groups fighting for the same customer segments could make competition fiercer if they ignored the market signals each group was trying to send. (Rivals from diverse strategic groups are most likely to converge upon each others' traditional customers if they face stagnant sales growth in their usual markets and insurmountable exit barriers.) Because turbulent settings will require SBUs to change tactics frequently to remain competitive, I expect lower degrees of internal transfers between SBUs and narrower breadths of integration than would exist in stable industries. Vertically integrated structures will create encumbrances that reduce SBUs' abilities to maneuver.

Bargaining Power

It seems unlikely that firms possessing bargaining power vis-à-vis suppliers or distributors (or customers) will transfer as much of their outputs internally, or that such firms will risk as much ownership equity in adjacent business units to control risky activities as will firms lacking such power. SBUs with bargaining power can often exert it to persuade outsiders to perform low value-added tasks for them (Porter, 1974, 1976). Bargaining power is also important in reducing firms' asset inflexibilities because it shifts uncertainty to outsiders.²

²This is the essence of the Japanese *kanban* or "just in time" system of cooperation with suppliers that is used in automobile manufacturing and other industries.

Three ways to approximate the bargaining power of SBUs are by estimating (1) the height of cost barriers to customers' switching suppliers, (2) the availability of alternate suppliers (or customers), and (3) the competitors' degrees of backward and forward integration. I expect less vertical integration when such cost barriers are not high than when they are high, because in the first case SBUs would lack the ability to control demand for their products effectively or to hold customers without investing in other forms of value-adding activity. Other conditions that would affect SBU's bargaining power include product or asset specificity (the inability to use resources in other activities), the ability to self-manufacture, and the dependence of a supplier (customer) upon the SBU for a large proportion of sales. Less ownership control is required when SBUs possess relative bargaining power over outsiders than when they do not.

Corporate Strategy Objectives

Up to this point, I have argued that less, rather than more, vertical integration is often advantageous from the perspective of a strategic business unit. Thus, the framework presented earlier in this study could encompass intrabusiness unit relations as well as relations with outsiders. Considering the importance of vertical relationships in the context of firms' corporate strategies, however, alters the framework's apparent rationale. Corporate strategy needs may increase the number of stages of integration undertaken or the proportion of ownership held beyond the levels of vertical integration other variables suggested. Thus, firms seeking to penetrate mature markets with new products will integrate forward to prove their product's superiority to risk-averse customers, maintaining full ownership of activities they deem of strategic importance.

Firms expect synergies to accrue when two or more SBUs share resources. This study used synergies with upstream (or downstream) SBUs to approximate the effect of corporate strategy needs upon vertical integration decisions. High market shares also appeared to indicate opportunities for firms to exploit integration economies (because of high levels of throughput). Other corporate requirements that could increase the perceived attractiveness of vertical integration include opportunities to capture a wider value-added margin, and the need to protect product quality, proprietary knowledge, or manufacturing integrity. The premium prices such products can command often offset high costs incurred by excess capacity in the vertical chain of processing. Extra safeguards vertical integration could provide for meeting these needs could include careful and detailed explanations to ultimate consumers, selling assistance, or critical coordination of component engineering. Where such image concerns are important, firms would be expected to exert substantial control over adjacent activities through more vertical integration—a hypothesis consistent with Bowman's (1978) finding of a V-shaped relationship between vertical integration and return on investment. Briefly, he found that highly integrated firms in the minicomputer industry prospered by doing most of their work themselves—R & D, production and service, as well as

other activities; minicomputer firms that merely assembled their products also prospered, but there was no middle ground.

The economic advantages of vertical integration will be transitory because industry structures (and relationships among firms) are not static. Since most industries become settings for volatile competition at some point in their evolutions, strategists must recognize that the long-term benefits of vertical integration are often primarily those of intelligence gathering or quality control. Moreover, vertical integration will not allay transaction costs so long as SBUs negotiate with each other (or with outsiders) for some portion of their supplies or distribution services. Only when a corporate-level decision has been made to force SBUs to deal with each other will the transaction costs Williamson (1975) described be avoided.

The following set of structural equations describes the hypothesized relationships, also illustrated in Figure 2:

<i>STAGES</i>	= f (corporate strategy, phase of industry development),
<i>DEGREE</i>	= f (number of stages, volatility of competition, SBU's bargaining power vis-à-vis outsiders),
<i>FORM</i>	= f (degree of internal transfers, SBU's bargaining power vis-à-vis outsiders, corporate strategy)
<i>BREADTH</i>	= f (degree of internal transfers, phase of industry development, volatility of competition).

The forces outlined in the preceding section affect all of the dimensions composing a firm's vertical integration, although (as the structural equations indicate) some of these forces will be affected directly, others indirectly. Moreover, if these were dynamic tests of vertical integration strategies, the mix of dimensions embraced at a particular time would influence the rate and nature of industries' developments, the volatility of competition therein, and a particular firm's future bargaining power vis-à-vis outsiders, as well as its future corporate strategy objectives.³ In the models tested, I expect the dimensions of vertical integration strategies to vary across firms because the environments in which some firms compete are more hospitable than others, and also expect vertical integration strategy dimensions to differ within particular industries because SBUs differ in their bargaining power vis-à-vis adjacent parties, and firms vary in their strategy objectives.

Table 1 summarizes the variables used as proxies for the relationships hypothesized to affect the dimensions of vertical integration strategies. I expect the most favorable environments for vertical integration to be those where, for example, demand was increasing steadily and few process innovations destroyed accrued cost advantages, but where switching-cost barriers prevented customers from deserting vendors, and competitors behaved like

³Tests of dynamic models are beyond the scope of this paper.

a symmetrical and stable oligopoly. Because of corporate strategy concerns, however, some firms will be vertically integrated even in less favorable settings because they cannot control the quality of suppliers' inputs or distributors' presentations adequately through their intrinsic market power. I expect vertical integration in volatile environments or where demand is highly uncertain to prove risky because opportunity costs incurred from excess capacity and strategic inflexibility will exceed the benefits firms could hope to achieve through integration.

METHODS

Information concerning the relationships between the target SBUs and adjacent business units was obtained in three stages: (1) construction of

TABLE 1
Relationships Hypothesized to Affect Dimensions
of Vertical Integration Strategies

Independent Variables	Hypothesized Relationship with Dependent Variables ^a
Phase of industry development	Positive and rapid sales growth encourages more stages and greater breadth of activities. Positive changes in sales growth (demand uncertainty), particularly those associated with obsolescence from rapid technological change, discourage integration.
Corporate strategy	Large market shares and synergies created by shared facilities with upstream and downstream SBUs encourage firms to engage in more stages of activity and to own greater percentages of vertical business units.
Volatility of competition	High exit barriers—proxies for other forces making industry competition volatile—discourage a broad range of SBU activities and high degrees of internal transfers or vertical integration because intensified competition makes returns unstable. Highly concentrated industries, by contrast, are less likely to be volatile. Such industries encourage high degrees of integration and a broad range of SBU activities.
Relative bargaining power	If the percentage of the three largest outside suppliers' sales represented by SBU's purchases is large, high degrees of internal purchases need not occur. If many outside distributors or customers are available, SBUs do not possess relative bargaining power and high internal sales are encouraged.

^aDependent variables include stages of integration, degree of backward and forward integration, breadth of SBU's activities, and form of integrated relationship.

background papers on each industry using archival data; (2) validation using field interviews; and (3) a three-round delphi-method questionnaire. The framework sketched above concerning the dimensions of vertical integration strategies was tested by studying the make-or-buy decisions of 192 firms competing in 16 industries during the years 1960–1981. Those SBUs operating within the target industries described in Table 2 were the units of analysis, although I also gathered measures for upstream and downstream sister units.

Sample Design

Table 2 identifies the industries of the target SBUs and the sample's total distribution among the 16 industries. Table 3 provides summary statistics describing the vertical integration strategy dimensions for the total sample. The column headings of Table 2 represent a taxonomy that was developed from *observable* traits, including both consumer and producer goods industries as well as those of varying ages. This taxonomy was used to insure that various features which make industries relatively attractive or unattractive environments for vertical integration would be represented in my sample of SBUs. The sample was also stratified to allow comparisons of industries having low demand uncertainty with those having high uncertainty, and also comparisons of industries characterized by stable competitive conditions with those characterized by volatile competition (Harrigan, 1983a).

Data Collection

Field studies used to gather data progressed in several stages, and employed a variety of corroborating sources. First, I generated preliminary hypotheses from a literature search concerning the use of vertical integration. The hypotheses were pretested and refined by interviewing strategists in a variety of firms; some of these firms were included in the subsequent delphi sample (explained in the next section). Background papers on each industry

TABLE 2
Distribution of Target SBUs in Industries Studied

Producer Goods Sold to Relatively Sophisticated Purchasing Agents		Mass Market Products Sold to Unsophisticated Buyers	
Acetylene	6.3%	Baby foods	3.1%
Coal gasification	4.2%	Cigars	3.6%
Genetic engineering	10.4%	Percolators	4.2%
Leather tanning	4.7%	Personal computers	7.8%
Petroleum refining	16.0%	Rayon and acetate	4.2%
Pharmaceuticals	10.4%	Solar heating	6.8%
Soda ash	3.1%	Tailored suits	6.3%
Receiving tubes	2.6%	Whiskey	6.3%
Total	57.7%	Total	42.3%

TABLE 3
Distribution of Sample Firms by Various Dimensions
of Vertical Integration Strategies

Degree of Backward Integration	
Non-integrated (no intrafirm transfers)	33%
Taper-integrated (between 0% and 80% intrafirm transfers)	52%
Fully-integrated (more than 80% intrafirm transfers)	15%
Degree of Forward Integration	
Non-integrated (no intrafirm transfers)	37%
Taper-integrated (between 0% and 80% intrafirm transfers)	38%
Fully-integrated (more than 80% intrafirm transfers)	25%
Breadth of Integrated Activities	
Not broad (fewer than 50% of all activities)	32%
Average breadth (50% to 75% of all activities)	34%
Broadly-integrated (more than 75% of all activities)	34%
Stages of Integration	
One stage (less than 75%)	29%
Few stages (between 75% and 150%)	58%
Many stages (index values greater than 150%)	13%
Form of Venture	
Contracts only (0% ownership)	39%
Quasi integration (less than 95% ownership)	23%
Wholly-owned (95% or more ownership)	38%

were then constructed from archival sources that included annual reports, other financial disclosure documents, trade journals and publications, and government documents. These background papers were later refined through field interviews, telephone conversations, follow-up letters, and revisions suggested by managers who participated in the study.

The Delphi Procedure. Estimates of the variables described in Table 4 were attained and refined from interviews and questionnaires using an iterative, delphi-like procedure. Initial estimates were developed as a starting point for the interviews from materials in the public domain and were scaled relative to competitors. Initial interviews were primarily face-to-face

because plant tours were often necessary to understand many issues concerning technologies and their relationships to vertical integration. Interviews, telephone conversations, follow-up letters, transcripts, and comments on preliminary drafts of each industry vignette provided revised estimates of these factors until estimates for the 192 competitors' contexts were developed.

TABLE 4
Operational Definitions of Variables Hypothesized
to Affect Vertical Integration Strategies

Variables	Operational Definition
Dependent	
Firm's number of stages in transformation process	Relative (index) number of steps in transformation process firm undertook.
SBU's degree of backward integration	Percentage of requirements the business unit obtains from upstream sister unit.
SBU's degree of forward integration	Percentage of requirements the business unit obtains from downstream sister unit.
SBU's breadth of integrated activities	Number of activities SBU engaged in divided by the number of activities it was possible to engage in.
Firm's form or percentage ownership of the vertical venture.	Percentage of equity ownership in the vertical business unit.
Independent	
Phase of industry development	
Sales growth	Percentage growth in SBU's industry sales
Demand uncertainty	Average dispersion of SBU's sales growth over five years, 1976 to 1981
Corporate strategy	
Synergy — upstream and downstream	Sum of percentage of resources shared with sister business units upstream and downstream
Market share	Business unit's percentage of industry sales
Volatility of competition	
Concentration ratio	Four-firm concentration ratio for target SBU's industry
Height of exit barriers	Scale for which exit barriers associated with plant and equipment estimated for 1981 strategic posture
Relative bargaining power	
Dependence of outside suppliers	Percentage of three largest outside suppliers' sales represented by the SBU's purchases.
Availability of alternate distributors (or customers)	Reciprocal of number of alternate distributors (or customers) where few distributors represents downstream bargaining power.
Competitors' degrees of backward and forward integration	An interactive variable created by multiplying the competitors' degrees of backward integration by their degree of forward integration to indicate the degree of integration in competitors' chains of activities.

Informants also provided information concerning the strengths and flexibilities of suppliers and customers, technologies, and other competitive factors affecting their industries. Newspaper accounts of price wars, divestitures, and acquisitions documented the changes in vertical integration that had occurred over time; interviews with industry participants corroborated my interpretations of the meanings of these events and estimates of these forces.

The delphi procedure allowed me to obtain estimates for variables that are not in the public domain and that firms might not collect routinely. By incorporating the opinions of expert judges, it also allowed me to refine estimates based upon imperfect information. In this case, the judges included executives familiar with the target industries (and adjacent business units), outside suppliers, outside customers, trade association executives, industry analysts, and industry observers.

Preliminary estimates of each variable for each SBU were revised by the appropriate judges three times. Each time, they were informed of the average value obtained from judges on the previous round. As the judges reassessed each variable, they discussed their reasoning (thereby providing additional insights concerning vertical integration relationships). Since the scales and measures developed were revised in the delphi rounds several times, respondents often converged in their estimates of the relative rankings of firms along various attributes. The resulting estimates for each SBU are scaled relative to competitors. Since the scalings were constrained to values between .01 and .99 for most variables, problems with heteroscedasticity have been reduced and observations can be pooled across industries.

Estimates of the variables presented in Table 4 were obtained from informants at 111 of the target firms, plus suppliers, customers, industry analysts, former employees, and other qualified industry observers. Since a delphi procedure was employed, it was not necessary to talk with all of the participants within an industry in order to develop estimates of their variables. By piecing together information provided from these many sources, who all dealt with nonresponding firms, it was possible to verify and fill in profiles of competitors that had been constructed from archival data. In this manner, interviews with 58 percent of the firms comprising the total sample facilitated estimates of variables for the firms that were not interviewed.

Dependent Variable Construction

A description of measurements for the dimensions of vertical integration follows. (1) The relative *breadth* of an SBU's activities was estimated by the number of adjacent activities it was engaged in—design, product or process R & D, production, testing, distribution, or other activities—divided by the maximum number of activities SBUs in that industry might reasonably engage in. Breadth was measured within the boundaries of the target SBUs identified in Table 2. (2) A comparison of firms' integrated *stages* was constructed by summing number of stages multiplied by the value-added for each respective stage. The stages of interest for this study have been described in detail elsewhere (Harrigan, 1983a, 1983b), and since the target SBUs formed the

basis for comparison, index values exceeded 1.00 for those firms engaged in long chains of vertically related activities. (3) Estimates of SBUs' degrees of integration were based on the percentage of internal transfers of key goods and services between sister SBUs operating within the stages under study, and separate estimates were constructed for upstream and downstream transfers. (4) The form of a particular integrated relationship was estimated by firms' percentages of ownership in the vertically-related business units under study.

In each case, the industries described in Table 2 provided the SBUs that served as reference points for construction of these estimates. The sample is profiled by these dimensions—breadth, stages, degree, and form—in Table 3, which indicates that the firms examined varied substantially in their mixes of strategy dimensions.

Independent Variables: Measurement and Rationale

Independent variables were constructed as follows:

Phase of industry development was estimated using sales growth and the dispersion of sales growth, measures that indicated whether demand was increasing rapidly or slowly and whether demand was characterized by large variations in volume.

Volatility of competition was estimated using the height of economic exit barriers and the four-firm concentration ratio. Although I constructed many other measures of industry structure, high multicollinearity prevented their use in the models specified below (Johnston, 1972).⁴

Relative bargaining power was estimated by using the percentage of total sales an SBU's purchases represented to its three largest outside vendors (a measure of supplier power). The PIMS data base and Porter (1974, 1976) use this measure to approximate suppliers' bargaining power over customers.

Customer bargaining power was estimated by using the reciprocal of the number of available distributors (or customers); when this index was high, distributors were relatively strong. A positive relationship seemed likely between this measure and an SBU's degree of forward integration.

A measure of competitors' integration strategies was also used because an SBU's bargaining power will be mitigated if customers (who may also be competitors) are themselves highly integrated. The presence of integrated competitors will reduce the availability of outside customers, thereby increasing a firm's need to become more integrated itself.

Corporate strategy needs were estimated using SBUs' market shares; I expected firms to desire more ownership control over business units when they held large market shares.

Corporate strategy objectives also came from estimates of synergy based upon the value and percentages of resources shared with the target SBU by upstream or downstream SBUs. I expected a positive relationship between

⁴Other estimates of industry structure may be obtained from the author.

synergies and the number of vertically related stages in which firms were engaged.

Replicating studies that did not question the same managers whom this study interviewed might obtain different estimates of these variables; however, similar values would be likely to result if the study were repeated with other subjects because managers were advised of their own previous estimates (as well as the range of estimates supplied by other respondents in their respective industries) as each round of the delphi inquiry progressed. If different industries were used, different estimates might result, but I would expect the relationships between these forces and the strategy dimensions to be similar.

THE MODELS

A regression model was chosen to estimate the effects of the environmental and corporate effects outlined above because the individual contributions of each class of predictor variable were of interest. An alternative treatment of these data could encompass a factor analysis procedure producing scalings that could be used in subsequent regression models (Hambrick, 1983). A factor analysis procedure, which might create interpretive difficulties, did not seem a superior analytical approach. Since I had already advanced a theory concerning the effects that affect choices of vertical integration strategy and did not need a method of generating underlying factors that might affect these strategies, regression models seemed the most appropriate analytical tool.

This study's central hypotheses were that vertical integration strategies will vary in *breadth*, *stages*, *degree*, and *form* depending upon (1) the demand conditions firms face, (2) competitive behavior within their industries, (3) their needs to control supplies (or distribution) more closely, and (4) corporate level strategy needs augmenting the amount of vertical integration that might otherwise occur. As noted earlier in this paper, some dimensions of vertical integration depend, in part, upon the values of other strategy dimensions, and I believe these relationships are recursive — that is, each of the endogenous variables can be determined sequentially. Moreover, the right-hand endogenous variables need not be correlated with the error terms. Consequently, ordinary least squares is an appropriate estimation procedure; I used two-stage least squares techniques to solve the models for degree, breadth, and form of integration. In the ordinary least squares specification of these relationships, the standardized coefficients of the independent variables (b_1) may be interpreted as their relative contributions to the corrected coefficient of multiple determination. The magnitude of the regular coefficients represent contributions to the relative likelihood that (1) a firm will engage in many integrated stages, (2) an SBU will transfer much of its output in-house (upstream or downstream), (3) an SBU will undertake many activities in-house, or (4) a firm will own a large proportion of its adjacent business units. The model could be stated in the following form:

$$\begin{aligned}
y_1 &= a_1 + b_1x_{11} + b_2x_{13} + e_1, \\
y_2 &= a_2 + b_1y_1 + b_2x_{25} + b_3x_{27} + e_2, \\
y_3 &= a_3 + b_1y_1 + b_2x_{36} + b_3x_{38} + e_3, \\
y_4 &= a_4 + b_1y_2 + b_2y_3 + b_3x_{42} + b_4x_{46} + e_4, \\
y_5 &= a_5 + b_1y_2 + b_2y_3 + b_3x_{54} + b_4x_{59} + e_5,
\end{aligned}$$

where y_i equals the dependent variables—the stages, upstream degree, downstream degree, breadth, and form, respectively, of the firm and SBU's vertical integration strategy. The independent variables, x_{ij} , correspond to a coding scheme where i (equals 1, 2, . . . , 5) represents the structural equation's number, and j (equals 1, 2, . . . , 9) corresponds to the independent variables as numbered in Tables 4 and 5.

Table 5 shows the correlations of the variables tested. In the interests of specification parsimony (and in keeping with the relationships outlined in Figure 2), the models are limited to one variable per category of force hypothesized to affect vertical integration strategy (plus the prespecified strategy dimensions). Including multiple measures of each force per equation would have produced imprecise regression coefficients. When the strategy dimensions were used for second stage analyses, the sample possessed a high degree of multicollinearity.

RESULTS

Results from the ordinary least squares and two-stage ordinary least squares models are presented in Table 6 and discussed in the following sections.

Number of Stages in the Integrated Chain

Positive sales growth and large synergies from shared facilities increased the number of stages in which firms were engaged. Declining sales decreased the number of stages, and both variables were statistically significant in the expected direction. Also as expected, the firms' number of stages was positive and statistically significant when used to generate second-stage estimators of the degree of backward and forward internal transfers by SBUs. This result suggests that firms are more likely to transfer goods and services internally if their SBUs operate in adjacent stages of processing than if they do not. If this were the case, it would call into question the efficacy of some firms' defining SBUs as the appropriate level for their resource allocation and strategic analysis activities. The intrafirm negotiation behavior that accompanies the setting of transfer prices and allegedly acts as a check on vertical integration would not seem to operate in these cases. Instead, corporate-level needs dominate the make-or-buy decision.

Degree of Backward Internal Transfers

Stable competitive conditions (represented in this specification by the four-firm concentration ratio) encouraged higher degrees of purchases from

TABLE 5
Basic Statistics and Correlation Matrix of Independent Variables

	Means (s.d.)	1	2	3	4	5	6	7	8	9
1. Sales growth	-.0031 (.0766)	1.00								
2. Demand (sales growth) uncertainty	.0631 (.0564)	-.18	1.00							
3. Synergy—upstream and downstream	.0880 (.1868)	.13	-.07	1.00						
4. Market share	.1371 (.1722)	-.11	.04	.05	1.00					
5. Concentration ratio	.3646 (.2106)	-.31*	.04	.06	.31*	1.00				
6. Height of economic exit barriers	.4950 (.2455)	-.02	-.06	.08	.14	.17	1.00			
7. Dependency of outside suppliers	.1312 (.2133)	-.04	-.07	-.10	.07	.13	-.02	1.00		
8. Availability of outside customers	.1015 (.1663)	-.35*	.04	.08	-.14	-.17	-.12	-.11	1.00	
9. Competitors' degrees of vertical integration	1.0904 (.8693)	-.06	.07	.36*	.02	.08	.33*	-.03	.01	1.00

*p = .01

in-house suppliers than did unstable conditions. Where an SBU possessed bargaining power over outsiders (by virtue of their dependence upon the SBU), it did not purchase as many of its requirements from in-house sources as did SBUs lacking such power. The coefficient for the stages variable (determined by industry sales growth and opportunities for synergies) was positive, suggesting that as industries develop and demand stabilizes, SBUs will increase their degree of backward integration.

The relationships found in Table 6 are both as expected and statistically significant, but results of my past studies of industry histories and firms' performances suggest caution (Harrigan, 1983a). Over time, being highly integrated backward cuts firms off from access to materials and processes that may prove to be less expensive than what they use. The more goods and services their SBUs transfer in-house, the less firms are exposed to the stimulus of outsiders' innovations, and the more they risk subsequent strategic inflexibility. In contradiction to the finding of MacMillan and his colleagues (1983) that instability encourages backward integration, I found indirect effects suggesting that demand instability *reduces* the degree of backward internal transfers, given the relationship this study found between industry development and firms' stages of integration.

Thus, this study's results suggest that where SBUs possess relatively high bargaining power over outside suppliers and can wrangle better prices and terms from them, less backward integration will occur than when they lack such power. The need to exploit synergies between SBUs is an example of a corporate intervention decision that, these results suggest, will mitigate this force.

Degree of Forward Internal Transfers

The results shown in Table 6 suggest that high exit barriers (representing an environment of volatile competition) discourage high degrees of internal sales. When competitors instigate rounds of price cutting, sales to sister SBUs are not assured if SBUs possess purchasing autonomy. The presence of high exit barriers increases the likelihood that marginal competitors who cannot exit will slash prices to fill their plants to break even on volumes. Again, the positive, statistically significant relationship with the number of stages variable suggests that corporate-level intervention to encourage sister SBUs to trade will mitigate these forces.

The positive and statistical significant result for relative bargaining power suggests that SBUs must rely more heavily upon in-house conduits to their markets when they face strong outside distributors (or customers) than when they do not. This relationship fits my resource-dependency framework that embodies the argument that high demand uncertainty encourages vertical integration. The relative lack of bargaining power such SBUs face would make them price-takers, who also lack bargaining power over sister units. SBUs that depend upon in-house customers face another competitive disadvantage: if SBUs are heavily forward-integrated, they lack a good feeling for their markets. My field studies of industry histories indicated that

TABLE 6
Results^a for Regression Model for the Total Sample

Independent Variables	Dependent Variables				
	Firm's Number of Stages	SBU's Degree of Backward Integration	SBU's Degree of Forward Integration	SBU's Breadth of Integrated Activities	Firm's Form of the Vertical Venture
Phase of industry development					
Sales growth	1.12*** (.19)	—	—	—	—
Demand uncertainty	—	—	—	-.15 (.03)	—
Corporate strategy					
Synergy—upstream and downstream	.33** (.14)	—	—	—	—
Market share	—	—	—	—	.08 (.05)
Volatility of competition					
Concentration ratio	—	.19** (.12)	—	—	—
Height of economic exit barriers	—	—	-.33** (-.21)	-.16* (-.13)	—
Relative Bargaining Power					
Dependence of outside suppliers	—	-.46*** (-.28)	—	—	—
Availability of outside customers	—	—	.92*** (.41)	—	—
Competitor's degrees of backward and forward integration	—	—	—	—	.06** (.20)

TABLE 6 (continued)

Independent Variables	Dependent Variables			
	Firm's Number of Stages	SBU's Degree of Backward Integration	SBU's Degree of Forward Integration	SBU's Breadth of Integrated Activities
Prespecified vertical integration strategy dimensions				
Firms' number of stages in transformation process	—	.38** (.18)	.61*** (.31)	—
SBU's degree of backward internal transfers	—	—	—	-.56*** (-.42)
SBU's degree of forward internal transfers	—	—	—	-.37*** (-.27)
Intercept	.83	.01	-.09	.24
Mean (standard deviation)	.86 (.36)	.35 (.34)	.69 (.27)	.88 (.27)
Corrected coefficient of multiple determination R ²	.05	.16	.20	.35
F-statistic (degrees of freedom)	4.72*** (189)	11.88*** (188)	15.37*** (188)	25.13*** (187)
				4.14*** (187)

^aFigures in parentheses are standardized regression coefficients indicating their relative contributions to the coefficient of multiple determination, given unequal standard deviations.

*p = .10

**p = .05

***p = .01

when firms finally "bit the bullet" and separated their intrafirm stages of processing, those that uncoupled the downstream stages first obtained a better understanding of the true nature of demand for outputs produced by upstream stages and a clearer understanding of the superiority of competitors' offerings than did firms that uncoupled upstream stages first (Harrigan, 1983a).

Firms often transfer large proportions of their outputs downstream through in-house units when there are cost advantages in doing so. The positive relationship obtained with the stages variable suggests that this corporate desire to capture more value-added may influence forward integration decisions, but caution in interpreting this result is warranted. Investigations of forward integration decisions (such as those this study explored) are relatively novel in the literature treating vertical integration. In the past, vertical integration has meant primarily that firms make their own components or acquire their own sources of raw materials. More attention has been devoted to upstream relationships than to the downstream, a side of the vertical chain that deserves more investigation in the future.

Breadth of SBUs' Activities

The results in Table 6 suggest that high demand uncertainty reduces the breadth of activities SBUs will undertake in-house. Similarly, high exit barriers—representing an environment of volatile competition—discourage SBUs from undertaking a broad range of activities in-house. These results are as expected, although the demand uncertainty variable is not statistically significant: firms were unwilling to increase their strategic inflexibility if demand and competitive conditions appeared to be adverse.

The negative, statistically significant relationships of breadth of SBUs' activities with their degrees of backward and forward integration is not surprising. The wider the boundaries defining SBUs, the broader the range of activities they perform in-house, and the less need they will have for purchases from or sales to adjacent SBUs.

Form of Percent Ownership of the Venture

The results shown in Table 6 suggest that a firm's having a high market share increases the likelihood that it will wholly own vertical business units. This coefficient is not statistically significant, but its sign is consistent with the relationship shown in Figure 2. Low bargaining power also increases the likelihood that vertical units will be wholly owned; this statistically significant relationship suggests that when firms cannot use the market power of their SBUs to control outsiders, they will instead use ownership to control uncertainties.

The relationship obtained between ownership and the degree of internal transfer variables indicates that firms are more likely to own their upstream business units fully than their downstream ones, a result that may be due to the large capital requirements and scale economies associated with most upstream technologies. Furthermore, the greater strategic stakes associated with

upstream business units than with downstream ones may make full ownership attractive. Preliminary findings concerning the use of joint ventures (described in Harrigan, 1985) suggest that firms will often consent to partial ownership in order to gain market access and distribution channels. Finally, firms need not own distributors in order to influence their behaviors if their SBUs' market positions are strong enough.

DISCUSSION

Firms use vertical integration, which varies along several dimensions, differently when competitive conditions and demand are hospitable than they do when they are not hospitable. Certain combinations of vertical-integration strategy dimensions appear with certain environmental forces more frequently than with others. The pattern of internal transfers and number of stages undertaken over time obtained in this study is different from that posited by Stigler (1951). This result suggests the value of a contingency approach to the use of vertical integration whereby firms use their inherent market power — when they possess such power — to spread risks and maintain strategic flexibility.

SBUs made less in-house, and firms were engaged in fewer stages of processing, where demand was highly uncertain than where it was certain. More internal transfers occurred where SBUs lacked the bargaining power to urge outsiders to undertake risky ventures than where they had such power, and this lack of bargaining power may have exacerbated firms' strategic inflexibilities. Although this paper does not contrast the vertical integration strategies of unprofitable firms with those of profitable ones, the results from my field studies suggested that going against the patterns that emerged in this research could prove disastrous. In particular, the findings regarding volatility of competition suggest that firms would be ill-advised to embrace high degrees of vertical transfers when the structures of their industries are not conducive to vertical integration.

The results also suggest that where firms possess bargaining power, they need not own a vertically related unit in order to enjoy the advantages vertical control provides. Firms might better seek quasi-integration, joint ventures, cooperative agreements, and contracts than full ownership in such situations. This suggestion could prove especially important when competition in one market is volatile and firms' SBUs in adjacent industries possess adequate bargaining power to exploit firms within the troubled industries. Firms might entrust some tasks to outsiders without forfeiting competitive advantages; their corporate strategies would suggest which tasks those might be. Once such tasks were identified, corporate intervention might be required to dissuade SBUs from undertaking activities that might endanger the well-being of the firm. Although empire-building tendencies of SBU managers may increase their desires to undertake a broad range of activities in-house, high demand uncertainty and volatile competition often mitigate advantages of doing so. SBUs would be better advised to play off outsiders for the best

terms and prices on some components and services, particularly if their bargaining power were high enough to exploit their advantage. A similar argument is appropriate at the corporate level regarding the number of integrated stages firms undertake. Long chains of processing exacerbate firms' exposure to the volatility of demand in multiple industries and increase the risks of imbalances and excess capacity at one or more stages of processing.

This study's results indicate that there may have been conditions that led firms to disregard competitive forces in subsidizing one SBU for the benefit of another. I found that some firms transferred more of their outputs internally at times when competitive conditions suggested that doing otherwise would have been wiser. The major reason for over-integration in such cases seems to have been needs of corporate strategy. As the results concerning volatile settings revealed, managers must weigh the costliness of sustaining losses in competition against the potential strategic gains they hope to make. My study of competitive histories revealed that some firms were willing to bear these costs in order to pioneer the development of new industries. Firms also bore these costs where the SBUs involved were of high strategic importance. The danger in this behavior is that of forgoing opportunities to spread risks to outsiders. As competitive conditions evolve, so should firms' uses of vertical integration.

Firms might also court danger by committing to inflexible, vertically integrated asset positions too soon — and hanging on to them too long; they must recognize whether or not such commitments best serve their strategy needs. Porter (1980) and others who have argued for preemptive strategies suggested that early integration may provide competitive advantages (MacMillan, 1983). Without dismissing the value of their arguments, I suggest a clarification based on an industry's stage of development. Such wildcat gambles, often acts of desperation, are most frequently made by firms in underdog positions (MacMillan, 1980). Firms that integrate early must often do so in order to gain toeholds in industries in which they could not afford to piggy-back on the later investments of others. Such firms must be prepared to fight the wars of attrition necessary to build new channels of distribution or to create other infrastructures they need. Their strategies will tolerate subsidizing initial losses created by vertical integration in order to achieve long-term success.

LIMITATIONS OF RESULTS

Measurement problems limit the results of this study. First, firms differ as to how they define their SBUs, and thus some SBUs studied were, for reasons beyond the scope of this study, more broadly-integrated than others. There are also limits to what field interviews, reconstructed histories, and delphi inquiries can teach about firms' vertical integration decisions. Finally, there may be other factors in operation that my framework does not encompass.

In a study where many structural variables could interact with each other, it was difficult to extract meaningful proxies for competition. High multicollinearity prevented my specifying all of the environmental variables collected in one model of vertical integration behavior. Firms' diversification strategies also created measurement difficulties. Despite meticulous efforts to measure these phenomena, I must be conservative regarding the degree of confidence with which my interpretations can be asserted.

The data seem to suggest that patterns exist among a firm's strategy, competitive environment, bilateral bargaining power, and degree of vertical integration. Tests with specifications other than a regression model (such as weighted least squares and the nonlinear cumulative logistic function) yielded similar results; such tests sometimes produced higher coefficients of multiple determination than the regression model did, but the corresponding beta values of the independent variables were also more difficult to interpret operationally.

The new dimensions this study developed and tested offer an alternative set of criteria for evaluating whether firms should segment or discourage vertically integrated relationships among SBUs. But caution is in order in interpreting the magnitude of the influence of environment on these dimensions. I suspect, for example, that sales growth and phase of industry development are key forces affecting firms' decisions to undertake many (or few) stages of vertical integration, but more study of this issue is needed.

CONCLUSIONS

This study expanded the operational meaning of vertical integration by developing the concept's principal dimensions and testing them with field interview data. Findings offer substantial evidence that vertical integration strategies differ across industries as well as within them. Findings also suggest that some combinations of vertical integration strategy dimensions are more likely within certain settings than within others. Firms must consider demand, competitive volatility, and behavior of outsiders when developing schemes to meet resource needs through integration. Since the bargaining power of outsiders can shrink or grow with time, knowledge of buyer-seller relationships will allow firms to shift the burdens of risky investments when they can.

Choosing vertical integration strategies is the province of the chief executive officer (CEO), a firm's chief strategist. Policies to augment intrafirm cooperation often require faith and perseverance in a long-term vision that originates with the CEO. Intervention to exploit potential intelligence or economic advantages (or to dismantle inappropriate relationships) may be necessary, especially where increasingly brief product lives, accelerated rates of innovation, or competitors' rapid capacity for expansion (and integration) characterize industries. Critics of business performance might do well to give top management some acknowledgement for taking risks and shaping vertical strategies for the long-term benefit of shareholders.

Finally, the nature of synergies must be reconsidered. No synergy between SBUs exists unless executives consciously enforce policies causing SBUs to (1) communicate, (2) share inputs, outputs, R & D, or other useful attributes and capabilities, or (3) cooperate in some other useful manner. If firms' management systems are weak, they can create situations in which vertical integration becomes a mobility barrier. If firms do not have internal mechanisms that balance needs for SBU autonomy and corporate strategy needs, they exacerbate their problems with vertical integration. Although, as Williamson (1975) suggested, firms may integrate to escape external costs associated with market transactions, there are costs to managing transfers across internal boundaries as well. If firms are unwilling or unable to bear these management costs, they may as well go to outside markets.

Firms use vertical integration to control their need for certainty, but if competitive conditions and demand become too unfavorable for them to endure, they will face increasing pressure to reduce the number of stages they engage in or their degree of integration. In dramatic contrast to Stigler's (1951) hypothesis, this study found that firms reduce their breadth of integrated activities and their number of stages in the early and late stages of their industry's development. But if firms lack the internal mechanisms needed to exploit the advantages integration can provide—if they lack the bargaining power needed to win concessions from suppliers (or from distributors or customers), or if their industries become highly volatile—then the strategic outlook for vertical integration does not seem good. Less internal investment may be better than more when weak firms contemplate the role of vertical integration in their corporate strategies.

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THE EFFECTS OF REGULATORY AGENCIES ON ORGANIZATIONS IN WOOD PRODUCTS AND HIGH TECHNOLOGY/ELECTRONICS INDUSTRIES

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This study compares the effects on organizations in two industries of regulatory agencies and other sectors of the task environment. Findings indicate that regulatory agencies differ from other sectors in their influence on planning and goal setting, the nature and frequency of internal organizational adjustments to their actions, and the specific characteristics of regulatory activities considered to be adverse. Firm size and age are systematically related to these differences. These findings are explained in terms of industry differences and changing dispositions of managers.

Over the past decade, the rapid growth in the social and environmental regulation of businesses by local, state, and federal governments has resulted in growing concern over the costs incurred by organizations in complying with regulatory requirements, a concern reflected in a variety of studies documenting that regulatory compliance costs impose a significant burden on organizations (Arthur Andersen & Co., 1980; Bervirt, 1978; De Fina, 1977; Rutledge, 1978; Weidenbaum, 1981; Weidenbaum & De Fina, 1978). These studies have been instrumental in focusing attention on the extent and nature of government involvement in business, but are limited in at least two important respects: First, firms' accounting systems usually do not make provisions for routinely tracking and accumulating costs arising from regulatory compliance (Miller & Yandle, 1979), so it is difficult to account for all such costs, and available data may understate actual amounts involved. Second, records of regulatory compliance costs, even when available, do not fully reflect feelings of frustration, fear, hostility, and resignation that may result from the adversarial relationship between regulatory agencies and organizations (Cole & Tegeler, 1979).

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In contrast to previous studies that focus on regulatory compliance costs, the conceptual framework used in this study emphasizes the view that organizations interact with different sectors of the task environment, and that the eventual effectiveness of organizations depends largely on the degree to which they are able to adjust and modify internal structures and processes to accommodate the requirements of these sectors (Lawrence & Lorsch, 1967; Thompson, 1967). For the present study, we asked top managers from two industries — high technology/electronics and wood products — to evaluate how their interactions with regulatory agencies were different from their interactions with more traditional sectors of the task environment, such as raw material suppliers, customers, suppliers of capital, competitors, and labor. Four hypotheses, developed from a synthesis of the research literature and field interviews, guided this inquiry. Because our interest is in assessing the comparative effects of different sectors of the task environment on organizations, specific differences within any of these sectors — specifically, differences among regulatory agencies — are not examined in detail. In the final section, however, we discuss our findings in the context of current research on regulations, and in relation to present regulatory reform initiatives.

Methodologically, the study consisted of three distinct but related phases: First, we conducted preliminary interviews with trade associations, regulatory agencies, and selected firms in the wood products and high technology/electronics industries to improve our understanding of business-government relationships. Second, we developed a survey questionnaire, and administered it to 80 firms in the two industries. We also obtained regulatory compliance costs of some firms (using methods suggested by Arthur Andersen, Inc.) and used these to corroborate questionnaire responses. Third, we conducted post hoc interviews (4 to 8-hour sessions) with managers of 14 firms to clarify questionnaire findings and to elicit participants' reactions to the results.

EMPIRICAL STUDIES AND RESEARCH PROPOSITIONS

While abundant anecdotes and case studies vividly portray the adverse nature of relationships between regulators and organizations, there are few systematic documentations and analyses of this problem. This lack might be attributed to what Sonnenfeld (1982) sees as the lack of complementarity between research in organizational theory and that in business and society. The latter has focused largely on public affairs issues, with little attention given to specific interactions between regulatory agencies and business organizations. On the other hand, the organizational theory literature has emphasized actions taken by organizations in response to customers, competitors, suppliers, and so forth, but not actions taken in response to those regulatory agencies (Keichel, 1979; Sonnenfeld, 1982). In addition, the common practice of aggregating the effects of different sectors of the task environment precludes a comparative analysis of the effects of different sectors. If regulatory agencies and the public affairs environment have, in fact, increased in importance over the years, as various researchers suggest (Post,

1978; Post & Mahon, 1980; Sonnenfeld, 1982), this change is not evident from empirical studies on environment-organization relationships.

Taken individually, these studies may not completely depict how regulatory agencies affect organizations, but their concepts provide a helpful framework for defining how the comparative effects of regulatory agencies on organizations might be evaluated. The results of our literature review and interviews are summarized in terms of four hypotheses, the first two based on the relevant literature, the second two developed inductively after a series of discussions with officials of trade associations, business firms, and government agencies and commissions.

Hypothesis 1: Different sectors of the task environment will have different effects on organizations within and among industries.

Thompson (1967) theorized that important sectors of the task environment that are unpredictable and uncontrollable create more contingencies for corporate planners than do stable sectors, because organizations have to devote more time to scanning the activities of unpredictable sectors, and because organizations may need to develop contingency plans and additional information-processing capabilities to compensate for their inability to predict accurately and control the actions of these sectors (Galbraith, 1979).

Drawing on Thompson's conceptualization, we hypothesize that sectors that are perceived by organizations to be more important, more unpredictable, and less controllable than others will create greater pressures for internal adjustments than sectors that are perceived to be more stable. With few exceptions (Hrebiniak & Snow, 1980), studies have typically operationalized environmental effects by aggregating individual measures of sectors of the task environment. This approach is not adequate, however, in specifying which of the sectors (i.e., customers, suppliers, regulators, and so forth) are important and require a high degree of managerial attention. By comparing sectors in terms of the measures suggested by Thompson (1967), we can begin to assess the relative importance of regulatory agencies.

Perceptions of importance, predictability, and controllability will vary among industries. This is consistent with findings by Hrebiniak and Snow (1980) indicating that patterns of managerial responses to uncertainty varied significantly among four industries: plastics/synthetics; semiconductors; motor vehicles; and air transportation. Moreover, managers in high growth industries are likely to interpret their external environments differently from managers in maturing or declining industries (Porter, 1983). Newer or start-up firms need information about which regulations apply to them and how they might most effectively comply, and will tend to view their agency relationships as unpredictable and uncontrollable. Also, because managers in older and more mature organizations have interacted more often with their regulators, it is conceivable that they would rate their agency relationships as being more predictable and controllable than do managers in newer businesses.

Hypothesis 2: Organizational adjustments will vary in direct response to actions of sectors in the task environment and will therefore vary in different industries.

Miles (1975) classified organizational adjustments as changes in procedures, personnel, processes, structures, and strategies. He suggested that, in general, frequency of adjustments to a sector of the task environment might reflect the relative importance of that sector, and hypothesized that adjustments vary in terms of their costs and difficulty of implementation. For example, strategic changes like mergers are far more expensive and more difficult to implement than changes in work-related procedures. Therefore, the nature and frequency of adjustments can be used to evaluate the comparative effects of different sectors of the task environment.

In the context of regulatory compliance, organizations may initiate changes in rules and regulations, fire and hire employees, modify their allocation of resources, make additions to plant and equipment, and, in more drastic circumstances, close plants and abandon major products. Organizations may also increase their boundary spanning activities with trade associations to present a united lobbying front to political constituents (McCaffrey, 1982). Case studies of regulation in the securities markets, the airline, trucking, and cable television industries (Weiss & Klass, 1981) present documentation on how industries have adapted to deregulation in strikingly different ways.

In our second hypothesis, we attempt to relate patterns of organizational adjustments to particular sectors of the task environment. Regulatory requirements, even when socially valuable, impose costs and adjustments for organizations. Some adjustments are necessary; others can be avoided. Regulatory requirements that are poorly administered, or that do not permit organizations to comply in the most cost-efficient manner make for avoidable adjustments. It is ironic that organizations are free to adjust in a variety of ways to actions taken by their competitors, suppliers, customers, and others, but are restricted in the ways they can comply with regulatory requirements. Analyzing the mechanisms used by firms to cope with regulatory agencies, particularly those mechanisms that are considered burdensome, would be helpful in directing reform initiatives. We also propose that adjustment patterns are different among industries. This proposition is based, in part, on several case studies (Weidenbaum, 1981), as well as a study on corporate responsiveness by Sonnenfeld (1982).

Hypothesis 3: Managerial perceptions of the adversity of relationships with regulating agencies will differ by industry.

In our interviews, we raised additional considerations about specific characteristics of regulatory agencies that managers perceived to be adverse to relations between regulatory agencies and their organizations. Regulatory agencies differ in terms of the frequency of their contacts and of their inspections of firms, in their effects on managerial morale, in the magnitude of record-keeping costs imposed on firms, in the type of attitude and dispositions exhibited by inspectors in their routine inspections, and in the degree

to which they are able to provide information on new requirements, or interpretations of existing regulations. While these considerations remain relatively unexplored by academic researchers, they have direct bearing on regulatory reform issues. For example, it is possible for regulatory agencies to develop a constructive and conciliatory approach without necessarily altering the basic intent of regulatory requirements. The identification of regulatory characteristics that create a disproportionate drain on managerial time and increase managerial frustrations would, therefore, be useful.

Managerial perceptions of adverse regulatory practices are also expected to vary among industries, partly because regulatory agencies differ from one another in terms of these basic practices. For example, businessmen and others have suggested that OSHA makes more frequent visits and inspections than any other regulatory agency. However, variations of regulatory relationships may also be explained by the stage of growth of an industry. In start-up industries for which regulatory requirements are unclear, having given insufficient notice or explanation of requirements might be rated as a highly adverse practice of a regulatory agency; in more mature industries characterized by more extensive business-government interactions, frequent inspections may be rated as a highly adverse practice.

Hypothesis 4: Managerial assessments of regulatory relationships will vary with the size and age of the organization.

Both firm size and age were included as contextual variables in this study in light of emerging issues in regulatory reform. There is some evidence suggesting that uniform regulations impose disproportionate burdens on small business (Cole & Tegeler, 1979). The age or maturity of firms has also been related to firm adaptability. The few organizational theorists who have studied the inception and growth of organizations argue that new businesses share many of the limitations of small-sized organizations, with a few important distinctions (Greiner, 1972; Haire, 1959; Lippitt, 1969; Miles & Randolph, 1980; Stinchcombe, 1965). These distinctions include: (1) risks of small businesses are exacerbated when these organizations are also new or young; (2) there are problems of coordination and control that accompany growth in a small firm, and (3) the consequences of even a single strategic error are much more serious in a young organization than in a mature one.

In this paper, we investigate the nature of adjustments made by different-sized organizations in response to government regulations. We also attempt to relate firm size and age to managerial perceptions of agency relationships in different industries.

METHODS

Research Instruments

A questionnaire was developed using measures from related studies that were appropriate to the four hypotheses. This questionnaire was then reviewed with officials from selected trade associations (these individuals

were not included in the final sample), and minor modifications were made to incorporate the rich store of anecdotes we were told concerning the two industries studied. The final questionnaire included items designed to measure the following factors:

Planning and goal setting indices. These measures were adopted from Dill's (1958) notion of task environment and Miles and Snow's (1978) concept of task contingency. Specifically, respondents were asked to rate the importance of each sector of the task environment — raw material suppliers, competitors, customers, suppliers, creditors, and regulatory agencies — and to rate their own abilities to predict changes and to control for the effects of each of these sectors.

Adverse characteristics of regulatory agencies. This measure was based on the anecdotal evidence provided by Weidenbaum (1981) and from our own pilot interviews. Respondents were asked to rate the following characteristics — frequency of contact with regulatory agencies, harmful effects on morale, costs of record keeping, noncooperative attitude of regulatory officials and inspectors, and difficulty in obtaining information — in terms of the severity of their effects on organizations.

Organizational adjustments. This measure was based on Miles' (1975) theory of adjustments. In order for participants to respond accurately, each organizational adjustment was defined with corresponding examples, as follows: (1) procedural — management-determined changes in rules, work procedures, work schedules, etc., (2) personnel-related — hiring and firing of personnel, hiring of consultants, changes in selection and training policies, etc., (3) process — major changes in budget allocations, significant modifications of planning and control systems, etc., (4) structural — additions or major modifications to equipment and facilities, creation or elimination of departments, etc., and (5) strategic — changes in basic product or service offered, abandonment of major product/services, mergers, etc.

Respondents were asked to rate the frequency with which they applied these adjustments in direct response to the actions of each sector of the task environment. To avoid possible interpretational problems regarding time periodicity, this question was constructed with specific answer scales within a given time period (1977–1979). The scale used was: never, rarely (once or twice), sometimes (three to five times), frequently (six to ten times), and considerable (more than ten times); these frequencies were based on information obtained from interviews with selected firms and trade associations.

Firm size and age. Number of employees was used as the measure of firm size. The data were obtained from questionnaires and then verified from standard corporation directories (e.g., Standard and Poor's). Age, measured by the number of years of operation, was obtained from the questionnaire.

Selection of Industry Samples and Response Rates

To provide greater latitude in interpreting the assessment framework, we deliberately selected two industries with different public and regulatory exposure: high technology/electronics (producers of electrical and industrial

equipment, components, and analytical test instruments), and wood products (producers of hardwood, veneer, plywood, and softwood). Companies in each industry were selected from the *Directory of Oregon Manufacturers* (State of Oregon, 1982) using Standard Industrial Classification (SIC) codes.

The two industries differ in one important dimension, stage of development. Because the influence of public affairs in the wood products industry has been discussed extensively (Sonnenfeld, 1981), only a few characteristics will be summarized here. The wood products industry is a mature industry with a considerable history of government regulation. Over the past two decades, for example, the industry has been subjected to a number of legislative acts, including requirements on land use and development, environmental quality improvement, clean air amendments, water pollution control, protection of endangered species, and resource conservation. The industry has responded in part to this pressure by developing three major trade associations that meet regularly and act as an important force in public affairs issues (Sonnenfeld, 1981).

In contrast, the high technology/electronics industry is relatively young; little is known about the extent to which this industry has actually suffered or benefited from government regulations; available anecdotal evidence is inconclusive. In discussing the electronic component industry, for example, Porter (1983) lists capital availability, supplier integration, services, management infrastructure, and foreign competition as key factors affecting the industry. There is little mention of the possible effect of government regulations. Comparing these industries provides a possibility of examining the differential effects of regulatory agencies on organizations at different stages of development.

Response Rates and Biases

A total of 308 questionnaires were sent to executives in the two industries. The overall response rate was 29 percent, with 28 percent for wood products, from the Oregon population of 245 firms, and 33 percent for high technology/electronics, from the Oregon population of 63 firms. Although this response rate compares favorably with prior studies that had an average response rate of 15 percent (Cole & Tegeler, 1979), it is not as high as others (Sonnenfeld, 1981). Thus, the possibility of biases due to selectivity needs to be addressed.

It can be argued, for example, that our respondents overrepresent those firms that have had unfavorable experiences with regulators and welcome this study as an outlet through which to express dissatisfaction and frustration. If so, this bias would restrict the generalizability of the results but not their validity, because, as this study attempts to examine the adverse effects of regulatory agencies, those firms that have had unfavorable experiences with regulators and are most concerned about the regulatory process are certainly appropriate to study. However, since nonrespondents might include more firms that have had favorable experiences with regulatory agencies, some consideration of other studies that focus on the benefits (Mitnick, 1980)

is advisable to ensure a more balanced point of view than our study alone might present.

The limitations of using a single source to represent a company's position have been discussed in previous studies (Downey, Hellreigel, & Slocum, 1975; Sonnenfeld, 1981). Individuals are likely to hold differing interpretations about regulatory relationships on account of prior expectations arising from differing functions and roles. This problem was resolved in part by asking the person who was primarily responsible for dealing with regulatory agencies to respond to the questionnaire. We also attempted to corroborate questionnaire responses in post hoc interviews. Finally, having collected records of regulatory compliance costs from a subset of the companies and correlated these costs with perceptual measures obtained from the questionnaires, we found that perceptual measures and regulatory costs were correlated in the hypothesized direction. A high level of company involvement in regulatory matters — for instance, frequent regulatory visits or much time spent with noncooperative regulators — correlated with higher administrative and compliance costs.

RESULTS

Evidence relevant to the four hypotheses was obtained from responses provided in the survey questionnaire and further examined in post hoc interviews conducted to obtain more detailed information about the regulatory process than could be inferred from a general survey. We visited a total of 14 firms — 8 producing a variety of wood products and 6 instrumentation and electronic companies. Whenever appropriate, intraindustry and interindustry differences are first discussed, and these findings explained using information obtained from post hoc interviews.

Hypothesis 1

Hypothesis 1 contends that sectors of the task environment will vary in terms of their importance, predictability, and controllability to organizations. As Table 1 shows, our findings indicate that government regulatory agencies were indeed perceived to be the least predictable and controllable of the task-environmental sectors in both industry samples. Using Scheffé's multiple comparison tests, we determined that, in the wood products sample, managers saw government regulatory agencies as significantly different from all other sectors in terms of the former's lack of predictability, and as significantly different from raw material suppliers, competitors, customers, and labor in terms of the former's uncontrollability. In the high technology/electronics sample, managers saw regulatory agencies as significantly different from raw material suppliers and customers in terms of unpredictability, and from raw material suppliers, customers, and labor in terms of uncontrollability.

TABLE 1
Planning and Goal-Setting by Sectors of the Task Environment
for Wood Products and High Technology/Electronics Firms

Planning & Goal Setting Indices ^a	Sectors of the Task Environment ^{a, b}						F
	Raw Material Suppliers	Competitors	Customers	Suppliers of Capital	Labor	Government Regulatory Agencies	
Wood Products (n = 64)							
Ability to predict	3.07* (1.00)	3.02* (2.06)	3.23* (.93)	3.41* (.99)	3.29* (1.00)	2.02** (.81)	17.24*
Importance of sector	4.37 (1.00)	3.27 (1.06)	4.16 (.93)	3.22 (1.30)	3.13 (0.95)	3.54 (1.05)	15.45*
Ability to control and influence sector	2.47* (1.23)	2.07* (0.96)	2.87* (1.02)	2.69 (1.11)*	3.00* (0.96)	1.45** (0.64)	21.94*
High Technology (n = 16)							
Ability to predict	3.19* (0.83)	3.13* (0.89)	3.25* (0.68)	3.00 (1.25)	3.00 (0.89)	2.13** (0.72)	3.46*
Importance of sector	3.63 (0.72)	3.25 (1.18)	4.44 (0.52)	2.75 (1.44)	3.06 (0.93)	2.44 (0.73)	8.50*
Ability to control and influence sector	2.75* (1.07)	2.56 (1.15)	3.19* (0.66)	2.40 (1.12)	2.81* (0.83)	1.63** (0.62)	5.14*

^aMean scores range from 1 (low) to 5 (high). Standard deviations are in parentheses.

^bSuperscripts **, indicate significantly different ($p < .05$) means based on Scheffé tests.

* $p < .001$ with 5 df.

In spite of their volatility, however, regulatory agencies were not considered to be particularly important in the development of goal-setting activities: regulatory agencies ranked third in importance, behind raw material suppliers and customers in the wood products sample, and ranked last in the high technology/electronics sample.

There are a few significant interindustry differences ($F = 6.11, p < .001$). Manager's firms in the wood products sample assigned considerably more importance to regulatory agencies than did those in high technology/electronics firms ($t = 3.95, p < .005$). The two industries also differed in that the wood products respondents assigned more importance to raw material suppliers ($t = 4.17, p < .005$). As the principal raw material supplier for wood products firms is the federal government, we can infer that the influence of regulatory agencies in the wood products industry is much more extensive. In Oregon, in particular, the amount of wilderness to be harvested, or retained and used for further study, is decided by federal regulatory agencies that administer resource planning regulations such as the Resource Planning Act and the Roadless Area Review and Evaluation Acts. Our findings indicate no significant differences between the two industries regarding their abilities to predict actions of regulatory agencies ($t = 0.46, n.s.$) and control these agencies ($t = 1.01, n.s.$).

Through post hoc interviews, respondents in the wood products sample provided additional explanations for our findings. Company officials indicated that changes in federal regulations dealing with extraction activities and timber use could be adequately anticipated and factored into their planning programs, but regulations dealing with environmental protection and worker safety were more troublesome. In these areas, interpreting existing standards was a major problem, one that has been exacerbated by the adversarial relationship between the industry and representatives of several regulatory agencies. In many cases, company officials tried to interpret the rules and regulations, only to find out in subsequent inspections that their interpretations were incorrect. Because of their desire to keep a low profile with regulatory agencies, company officials often did not seek clarification at the time these interpretations were formulated.

Similarly respondents in high technology/electronics firms rated regulatory agencies as the most difficult to predict and control, indicating, in post hoc interviews, that regulatory information was difficult to obtain, or, when available, the information was too general to help them plan for plant sites and zoning requirements. The seeming lack of sensitivity of regulatory agencies to problems faced by firms seeking to build new plants or expand capacity was another source of conflict. In one case, a firm received rejections on all of its four site proposals, with little explanation from the agency to clarify its guidelines. In addition, firms complained of the political manipulations and resulting time delays that were associated with a particular proposal to build a new plant.

Another source of difficulty was the perception that the policies of federal and state government regulatory agencies overlapped, and sometimes

were in conflict. One firm indicated that, in at least one case, state-enforced guidelines for water purity standards far exceeded those that were formulated by federal regulatory agencies. In a different case, it was reported that federal regulations on park and recreational use were in direct conflict with state-regulated statutes on land use. While these reports do not present dilemmas as clear as those reported elsewhere (Healy, 1979), they are helpful in explaining some of the difficulties experienced by firms in planning for regulatory changes.

In spite of perceived instability of government regulatory agencies, they were not rated by respondents in high technology/electronics firms as important compared to other sectors of the task environment. One explanation is that, for these firms, the adversarial quality of regulatory agencies appears principally in decisions relating to plant locations and zoning requirements, and not in those bearing on profitability or market share. This contrasts with the wood products industry in which decisions by regulatory agencies directly affect the profitability (e.g., compliance costs) and resource allocation (e.g., timber production) of the firms.

Hypothesis 2

Hypothesis 2 contends that organizational adjustments to different sectors of the task environment vary. Table 2 presents the types and frequencies of adjustments reported by the two industry samples as direct responses to actions taken by consumers, raw material suppliers, competitors, suppliers of capital, labor, and regulatory agencies.

For the wood products sample, there were considerable differences in each type of adjustment for each business environmental sector. By and large, actions of raw material suppliers, consumers, and regulatory agencies stimulated most adjustments made in this industry. Adjustments for changes in regulatory requirements consisted primarily of personnel-related actions (e.g., hiring and firing of personnel), structural changes (e.g., adding or eliminating departments to deal with regulatory requirements), and procedural changes (e.g., minor changes in work standards and procedures).

Caution should be taken in interpreting findings for the high technology/electronics sample as many of the relationships were not statistically significant. Findings indicate that consumers and raw material suppliers, primarily, have stimulated adjustments by high technology/electronics firms. The effects of other environmental sectors — such as competitors, suppliers of capital, labor, and regulatory agencies — appeared to be minimal. For the most part, adjustments made in response to regulatory agencies consisted of procedural and personnel changes.

In post hoc interviews, respondents disclosed that adjustments were generally reactive — that is, made after citations had been issued. However, some indicated that their companies are responding to anticipated OSHA requirements by developing internal standards to meet both existing and possible future changes. Of specific concern in this particular context are regulatory requirements that do not permit firms to comply in the most

TABLE 2
Organizational Adjustments to Different Sectors of the Task Environment

Type of Adjustment	Sectors of the Task Environment ^{a,b}						F ^c
	Raw Material Suppliers	Compe- titors	Customers	Suppliers of Capital	Labor	Government Regulatory Agencies	
Wood Products (n = 64)							
Procedural	3.04 (1.45)	1.93* (1.07)	2.27 (1.24)	1.56* (1.06)	2.21 (1.24)	2.75** (1.37)	10.40***
Personnel	2.19 (1.20)	1.68* (.86)	1.70* (.96)	1.28* (.69)	2.13* (1.25)	2.86** (1.37)	13.97***
Process	2.85 (1.32)	1.95 (1.07)	2.41 (1.22)	1.74 (1.02)	1.56* (.88)	2.29** (1.17)	9.97***
Structural	2.42 (1.13)	1.79 (.87)	2.13 (1.05)	1.55* (.97)	1.42* (.66)	2.54** (1.26)	11.74***
Strategic	1.93 (1.08)	1.77* (1.03)	2.27 (1.24)	1.40 (.74)	1.31 (.61)	1.63 (.96)	7.38***
High Technology/Electronics (n = 16)							
Procedural	2.40 (1.12)	1.33 (.90)	2.47 (1.30)	1.56 (1.21)	1.93 (1.06)	2.00 (.82)	2.60*
Personnel	1.64 (.93)	1.53 (.99)	1.87 (.99)	1.38 (1.09)	1.88 (.89)	1.81 (.75)	0.73
Process	2.33 (1.11)	1.67 (1.29)	2.47 (1.41)	1.75 (1.44)	1.44 (1.03)	1.69 (.87)	1.77
Structural	1.14 (.54)	1.53 (1.30)	1.87 (.99)	1.56 (1.41)	1.31 (.60)	1.31 (.60)	1.01
Strategic	1.50 (.76)	2.20 (1.37)	2.60 (1.35)	1.75 (1.44)	1.44 (1.03)	1.25 (.45)	3.18**

^aMean scores range from 1 (low) to 5 (high) frequency. Standard deviations in parentheses.

^bSuperscripts *, ** indicate significantly different (p < .05) means based on Scheffe tests.

^cdf = 5

*p < .05

**p < .01

***p < .001

efficient, cheapest way; for instance, in one company, officials thought that personal protection devices for employees were less costly and more efficient in cutting down machinery noise than were expensive noise muffling devices mandated by OSHA.

Hypothesis 3

Hypothesis 3 contends that regulatory agencies differ in terms of how their positions are perceived by organizations, and that these differences hold among industries. Table 3 presents the effects of five regulatory practices for the two industry samples.

TABLE 3
Adverse Practices of Regulatory Agencies as Perceived
by Respondents from Two Industries

Practices	Industry		t-scores ^a
	Wood Products (n = 64)	High Technology/ Electronics (n = 16)	
Frequency of contact	3.70 ^b (1.02) ^c	2.27 (.79)	5.34*
Harmful effects on morale	3.72 (1.11)	3.00 (1.10)	1.93
Costs of records	3.12 (1.09)	3.09 (.70)	0.60
Non-cooperative attitude of inspectors	2.93 (1.12)	2.91 (.94)	0.07
Difficulty in obtaining regulatory information	2.68 (1.31)	3.18 (.87)	6.09*

^aMANOVA tests: Hotelling-Lawley trace, $F_{5,68} = 2.17$, $p = .07$; two-tailed test

^bMeans; 1 = low impact; 5 = high impact.

^cStandard deviations.

* $p < .005$

There are key differences between the wood products and the high technology/electronics samples with respect to their relationships with regulatory agencies ($F = 2.17$, $p = .07$). The frequency of contact and inspections was greater and perceived to be more adverse in the wood products sample ($t = 5.34$, $p < .005$), but firms in the high technology/electronics sample reported more difficulty in obtaining information about regulatory requirements ($t = 6.09$, $p < .005$). The two industry samples did not significantly differ as to harmful effects on morale, costs of record keeping, and noncooperative attitude of government inspectors.

Patterns within each industry are also worth noting. Respondents from wood products firms reported frequency of inspections and harmful effects on morale to be the most severe adverse characteristic of regulatory agencies, but those in the high technology/electronics sample considered the difficulty

in obtaining regulatory information to be the most severe. In both industry samples, the cost of records and record keeping and the noncooperative attitude of government inspectors had moderately high to low adverse effects.

While this study was not intended to document specific differences between regulatory agencies, additional analysis and information obtained from post hoc interviews indicated that variations in regulatory effects hold among different regulators. For example, respondents from the wood products sample perceived OSHA as making the most visits and inspections, the Bureau of Labor as requiring a lot of paper work, and the Land Conservation and Development Commission (LCDC) as noncooperative and as creating adverse effects on employee morale. In the case of the high technology/electronics firms, the Department of Commerce made the most contact, and the Bureau of Labor was perceived as having the most adverse effects on morale. Consistent with findings from aggregate data, high technology/electronic firms expressed difficulty in obtaining information from LCDC, the Department of Environmental Quality, the Department of Commerce, and the Bureau of Labor.

Post hoc interviews also provided additional information on the nature of inspections by regulatory agencies. Most of the respondents from the wood products industry expressed a sharp dislike for inspections, particularly from OSHA. Those in the high technology/electronics industry viewed the visits as unnecessary, but saw the problem as minor compared to the problem of obtaining regulatory information.

Hypothesis 4

Hypothesis 4 contends that assessments of agency issues vary with the size and age of the firm. Selected correlations between size and age and the variables studied for regulatory agencies, presented in Table 4 provide modest support for this proposition overall. The ability to predict and control regulatory agencies was positively and significantly related to firm size in the wood products sample. Moreover, the larger and older firms granted greater importance to these agencies in their planning activities. Also, older firms reported better abilities to control the actions taken by regulatory agencies than do newer firms.

Findings for the high technology/electronics sample are not as compelling: the only significant association found was between age of firms and the importance granted to regulatory agencies in planning activities. Our findings indicate that managers in different-sized firms perceive some practices of regulatory agencies to be more adverse than others. In the wood products sample, size of firm was associated with high costs of record keeping and difficulty in obtaining regulatory information. However, there is no significant difference between younger and older firms in terms of their perceptions of the adverse characteristics of regulatory agencies. In the high technology/electronics sample, younger and smaller firms perceived more harmful effects on morale arising from their interactions with regulatory agencies than do older and larger firms.

TABLE 4
Pearson Correlations for Planning Indices, Adverse Regulatory Practices, Organizational Adjustments, and Age and Size of Responding Organizations in Two Industries

	Wood Products (<i>n</i> = 64)		High Technology (<i>n</i> = 16)	
	Size ^a	Age ^a	Size ^a	Age ^a
Planning indices				
Ability to predict government actions	.21*	.16	.12	-.17
Importance of government actions	.32**	.27**	.07	.74***
Ability to control actions	.27*	.45***	.28	.04
Adverse regulatory practices				
Frequency of contact	.17	.19	.10	.05
Harmful effects on morale	.10	.10	-.50*	-.13
Costs of records	.33**	.17	.12	.28
Noncooperative attitude	.13	.03	.06	-.16
Difficulty in obtaining information	.22*	.13	.55*	-.11
Organizational adjustments^b				
Procedural	.23*	.15	.20	.34*
Personnel	.35**	.05	.46*	.47*
Process	.18	.03	.12	.49*
Structural	.12	.17	.08	.12
Strategic	.35**	.29**	.05	.15

^aSize and age variables were measured by their logarithms.

^bAdjustments are in direct response to actions taken by regulatory agencies.

**p* < .05

***p* < .01

****p* < .001

Organizational adjustments were related to firm size and age, although such effects were more pronounced in the wood products sample. Generally, larger firms in that sample reported more frequent strategic, personnel, and procedural adjustments than did smaller firms; older firms were generally associated with more strategic adjustments. In the high technology/electronics sample, larger firms tended to make frequent personnel, adjustments and older firms tended to make more frequent procedural, personnel, and process adjustments than did newer firms.

Some initial findings that were difficult to interpret were subsequently clarified in post hoc interviews. For example, costs of record keeping were inversely related to age and size of firms in the high technology/electronics

sample, but directly related in the wood products sample. In the case of high technology/electronics firms, record keeping included regulatory information on land use as well as applications and petitions by the firms for land sites and building code approval. As new firms experience difficulty in obtaining this information, their costs for maintaining records would understandably be high. Over time, however, the firms eventually receive this information and settle their petitions, which results in lower record-keeping costs. This would explain why newer firms generally report more stress and lower morale when dealing with government agencies than do older firms.

In the wood products industry, record keeping referred to documents required by various regulatory agencies to ascertain compliance with various statutes. As firms become older and are required to submit more reports on a regular basis, the costs of record keeping increase. It was also reported that some firms had to hire full time clerks to attend exclusively to regulatory matters. As such, record keeping costs would be positively related to the growth and age of a firm. Thus, the relationship between the cost of record keeping and age and size is interpretable when the types of reports are considered.

SUMMARY AND IMPLICATIONS FOR REGULATORY REFORM

Overall, our findings indicate that regulatory agencies differ from other sectors of the task environment in terms of the manner in which they influence the planning and goal-setting activities of organizations, the specific characteristics they have that organizations consider adverse, and the nature and frequency of adjustments made by organizations to their actions. There is also some evidence that firm size and age are systematically related to these differences. Finally, from post hoc interviews, there is some indication that different regulatory agencies vary in terms of their influence on organizations.

Two industries that had different levels of regulatory exposure were selected to provide wider latitude in interpreting the findings. In the wood products industry, which has been subjected to government regulations for several decades, major concern centered on a litany of presumed regulatory misdeeds arising out of the adversarial relationship that had developed through the years. It is not surprising that these respondents rated "harmful effects on management morale" as the most damaging impact of regulatory agencies. The adversity between managers in this industry and regulatory agencies might also explain why regulatory agencies were rated as the most difficult sector of the task environment to predict and control, and why frequent organizational adjustments were made to respond to and anticipate actions by these agencies.

In contrast, respondents in the high technology/electronics industry reported obtaining regulatory information to be particularly burdensome. This problem did not pertain to a single regulatory agency but to all agencies

that were investigated in depth in this study, a fact that might be explained by the newness and technical nature of the industry making it difficult to develop regulatory standards.

Two variables — firm size and age — were included in response to emerging regulatory reform initiatives. This study provides additional support for a suggestion from the existing literature that smaller firms face disproportionate burdens in complying with uniform government regulations because of their limited resources. Smaller firms are generally unable to control the actions of regulatory agencies and experience higher levels of employee frustration.

Our findings on the effects of age also support the theoretical position and empirical findings of an earlier study by Sonnenfeld (1981). He noted that older wood product firms, with long-standing, well-articulated codes of conduct, and long traditions of community awareness, differed from younger firms in terms of their responsiveness to public affairs issues. In our study, younger firms reported lower abilities to control the actions of regulatory agencies, granted lower importance to regulatory agencies in the planning process, and made fewer organizational adjustments in direct response to regulatory decisions, than did older firms. It was suggested in interviews that as firms became more familiar with the regulatory process, they became more responsive and frustration levels were reduced.

Accordingly, this study presents implications for regulatory reform. First, we need to distinguish between regulatory costs that are endemic to regulation and regulatory inefficiencies that impose additional costs and burdens on organizations. Respondents in this study indicated that many regulations were justifiable, but that the methods of compliance were oftentimes limited and not always the most cost-efficient. Other characteristics, such as undue pressure of inspections and the lack of adequate regulatory information, contributed to such inefficiencies. Therefore, reform actions can be focused on improving coordination among agencies to minimize inefficiencies without necessarily altering the basic form or intent of regulations. A second implication for reform is that greater consideration be given to using a tiering approach to regulatory requirements. Regulatory agencies may find it possible to achieve the same results, with less burden, through tiering requirements for different sizes or classes of firms, since the disproportionate cost of compliance encountered by smaller firms would be reduced. An example of a tiered approach to regulation is the Workers' Compensation Department exemption of employers with ten or fewer employees from routinely keeping injury and illness results on their workers. The extension of such efforts to other regulations would appear to be a formidable task, yet, in light of the findings on disproportionate impact suggested by this study and others, this effort would appear worthwhile.

Limitations of this study raise issues that need to be better resolved in future studies. One intriguing issue is the possibility of the selective response bias that the 29 percent response rate in this study might reflect. If non-respondents represent firms with a history of increased cooperation with

regulatory agencies, their favorable impressions of the regulatory process would certainly, considered along with studies focused on examining adverse regulatory effects, provide a more balanced point of view than our study alone. Another issue involves the consideration of organizational variables other than size and age that may moderate the effects of regulatory agencies. These would include executive leadership and values of the dominant coalition (Miles, 1982), ideological and strategic variables (Meyer, 1982), and historical and cultural factors (Sonnenfeld, 1981). The development of a more comprehensive model with which to assess regulatory pressures is an area that deserves conceptual and empirical attention in the future.

Two extensions of this study are worth noting: First, there is need to relate perceptions of regulatory effects to organizational performance. Sonnenfeld (1982) indicated that more effective firms tend to develop more favorable reactions to regulators than do less effective firms. Concerns relating to the undue frequency of inspections and their harmful effects might actually reflect poor performance or the ineffectiveness of the responding firm. Moreover, there is need to fully document the pattern of regulatory effects among different regulatory agencies. In this study, we found that the Bureau of Labor imposes an enormous amount of record keeping on firms in both industries. OSHA is rated by wood products firms as excessively high in visits and inspections, but not by high technology/electronics firms. These patterns would provide useful guidelines for future reform directives and a better understanding of regulatory relationships.

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AN EMPIRICAL EXAMINATION OF THE RELATIONSHIP BETWEEN CORPORATE SOCIAL RESPONSIBILITY AND PROFITABILITY

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Although there has been considerable research into the relationship between corporate social responsibility and profitability, it has frequently reflected either an ideological bias or limited methodological procedures. Research has also been impeded by the difficulty of adequately measuring corporate social responsibility. This study, using an elaborate, forced-choice instrument administered to corporate CEOs, did not find any relationship between social responsibility and profitability. Specifically, varying levels of social orientation were not found to correlate with performance differences.

Although an enormous body of literature has emerged concerning corporate social responsibility, actual empirical research designed to test the multitude of definitions, propositions, concepts, and theories that have been advanced has been scarce. In addition, much of the research done in the area has been incomplete and simplistic in methodology. Abbott and Monsen have observed that "the empirical study of corporate social involvement is in an undeveloped state" (1979: 501).

Many of the methodological quagmires in studying corporate social responsibility stem from the nature of the subject, a relatively new field of study whose concepts are value laden and susceptible to particular ideological and emotional interpretations. Perhaps the overriding research constraint has been the difficulty of developing valid measures. Arlow and Gannon, in their recent review (1982) of the relationship between profitability and corporate social responsibility, observed that all the various studies relied upon questionable indexes of social responsibility. Assessing profitability is a relatively clear-cut process, but assessing social responsibility is not.

The problem in assessing levels of corporate social responsibility is objectively determining appropriate criteria and standards of corporate performance, a kind of difficulty typical of the labyrinthian problems confronting social audits. For instance, Parket and Eilbirt observe that:

To be sure, the scope of endeavor categorized by the term social responsibility cannot be analyzed on the order of a balance sheet or profit and loss statement. There are, as yet, no accounting techniques, analytical tools, or statistical methods which will

objectively differentiate companies that are socially responsible from those that are not. To measure degrees of social responsibility would be an even more ethereal task (1975: 6).

The whole process of the corporate social audit is so vague that Robert Jensen, a leading researcher in the social accounting area, has commented that "in most instances we are still groping in the dark concerning what to disclose, how to disclose it, and how to compare and evaluate business enterprises" (1976: 2). Jensen also observed that:

Social accounting, and especially corporate social accounting, is in some instances an attempt to conjure up an image or representation of the institution constituting the "real object." The image created may range from hideous to angelic depending on who is conjuring up the image. Social accounting is like a kaleidoscope in that the same pieces turned a little differently form a whole new pattern (1976: 1).

Compounding difficulties in studying corporate social responsibility has been the lack of an effort to empirically test definitions, propositions, and concepts; researchers have tended to create their own measures rather than to use one of the many preexisting definitions in the literature. Not only has this hindered interstudy comparisons and analyses; it has limited development of a research base in the social issues area.

The initial purpose of this study was to develop an instrument to measure degree of orientation to social responsibility based upon a model defining corporate social responsibility that has appeared in the literature. Carroll (1979) developed the definition used in this study for instrument development. Although no single defining construct has universal acceptance, Carroll's conceptualization has multiple components that lend themselves to measurement and testing. Another, related purpose was to use the instrument to assess how CEOs viewed their firm's social responsibilities. Our ultimate purpose was to investigate the relationship between orientation toward corporate social responsibility, as measured through the instrument, and profitability.

THE LITERATURE ON CORPORATE SOCIAL RESPONSIBILITY AND PROFITABILITY

The first issue of *Business and Society Review* gave us the initial impetus for examining the relationship between corporate social responsibility and profitability. In that issue, Editor Milton Moskowitz suggested that socially responsible firms were good investment risks even though "there is at this point no real evidence that capital markets will be materially affected by social performance" (1972: 71). While Moskowitz made no explicit claim that such firms were good investment risks, he clearly implied it, and, in addition recommended 14 firms as potential investments because of their social performance: "... the securities are being suggested here on the basis of corporate behavior that can be considered socially responsive" (1972: 72). However, he never revealed what criteria he used in selecting these 14 firms.

The next issue of *Business and Society Review* observed that the 14 socially responsible firms identified by Moskowitz had registered a stock price increase of 7.28 percent over the previous six months, in contrast to a 4.4 percent rise for the Dow-Jones, a 5.1 percent increase for the New York Stock Exchange, and a 6.4 percent gain for Standard and Poors Industrials during that period. This finding was used to support the notion that socially responsible firms were good investment risks.

Stanley Vance challenged the findings and claims of Moskowitz and *Business and Society Review* in a 1975 *Management Review* article. Vance examined the market performance of the 14 Moskowitz-recommended firms from 1972 to 1975 and found that stock in all of the firms had declined in price and had performed far below the Dow-Jones, the New York Stock Exchange Index, and the Standard and Poors Industrials (1975: 19).

To support his tentative conclusion that socially responsible firms are not good investment risks, Vance extended his analysis to looking at the performance of firms identified as having high and low levels of corporate social responsibility in surveys reported by *Business and Society Review*. He compared the financial performance of the firms rated highest in corporate social responsibility with that of those rated lowest and found that the latter outperformed the former. Although he performed no statistical test to determine whether differences were significant, Vance did correlate corporate social responsibility and financial performance, and, finding a negative relationship, concluded that socially responsible firms were not good investments (1975: 24).

There are similar methodological problems with the exploratory work of both Moskowitz (1972) and Vance (1975). The initial 14-firm sample used by each was small and subjectively selected. In addition, both studies relied upon a performance criterion that considered only capital gains or losses. There was also no adjustment for risk; not all stocks reflect the same degree of risk. In addition, the performance time period was short in the Moskowitz study. The Vance study used reputational surveys that reflected a response rate of 11 percent, with the typical responder rating only 20 of 45 firms considered.

Table 1 provides a chronological review of the major research efforts in this area; some of the more important of these research efforts will be briefly examined. Alexander and Buchholz (1978) did an important study that followed up on the efforts of Moskowitz and Vance. The major methodological difference between the Vance study and that of Alexander and Buchholz lies in the area of risk adjustment for the firms identified in the reputational survey. The latter study utilized the betas¹ of each firm to adjust performance. When examining the issue of risk, Alexander and Buchholz were able to conclude that "there seems to be no significant relationship between stock

¹Beta is a measure of sensitivity of a firm's stock price in context of overall fluctuations in the New York Stock Exchange composite average.

TABLE 1
Studies Examining the Relationship between Corporate
Social Responsibility (CSR) and Profitability

Study	Methodology	Performance Criteria	Findings Implications	Limitations
Moskowitz (1972)	Simplistic comparison of stock price increases in Moskowitz' 14 firms with "perceived" high CSR with the average increase in the Dow-Jones Index.	Stock price increases over time (six months)	High CSR firms outperform the Dow-Jones Industrials.	No adjustment for risk; small sample; sample is not necessarily representative of high CSR firms; performance measured over short-term; performance criterion is questionable; no test for significance.
Bragdon & Martin (1972)	Seventeen firms in the paper and pulp industry were rated on a pollution index developed by the Council of Economic Priorities. Each firm's index was compared to its ROE.	Return on equity (ROE)	The better the pollution index, the higher the ROE.	No adjustment for risk; findings limited to one industry; limited definition of CSR; small sample; performance criterion is inadequate; no test for significance.
Bowman & Haire (1975)	Eighty-two food processing firms classified into low, medium, and high CSR categories based on the number of lines devoted to the topic of CSR in corporate annual reports. The CSR categories are compared on the basis of their ROE.	Five-year return on equity	Existence of a U-shaped performance curve; the highest performing firms being those found in the middle range of CSR.	No adjustment for risk; lopsided sample; reliance on annual reports and on the CSR firms of Moskowitz; performance criterion is inadequate; no test for significance.

TABLE 1 (continued)

Study	Methodology	Performance Criteria	Findings Implications	Limitations
Parke & Ellbirt (1975)	96 firms that responded to the researchers' previous CSR survey were assumed to be CSR firms. The profitability of 80 of these firms compared to the Fortune 500.	Absolute net income, profit margin, ROE, and EPS	On all four measures, the 80 CSR firms proved to be more profitable.	No adjustment for risk; questionable sample; performance measured over short-term (12 months); performance criterion is inadequate; no test for significance.
Vance (1975)	Two-fold: 1. Replicating Moskowitz 2. Correlating CSR firms derived from two Business and Society Review Surveys with stock price changes over time.	Stock price increases over time	CSR firms are determined not to be good investments; negative correlation between CSR and stock price increases.	No adjustment for risk; questionable samples; performance measured over short-term; regression line does not fit the data; performance criterion is inadequate.
Heinz (1976)	Correlating CSR ratings of 29 firms from a Business and Society Review survey with ROE.	Several measures such as ROA, ROE, and profit margins	A significantly positive correlation between CSR and ROE.	No adjustment for risk; small sample; questionable sample; reliance on reputational rating system for determining CSR.
Sturdivant & Ginter (1977)	A population of 67 high CSR firms as identified by Moskowitz in the Business and Society Review are used in a CSR survey. Twenty-three firms returned 130 questionnaires. The 67 firm population is also reduced down to 28 firms and reclassified	10 year EPS growth	High CSR firms (Best and Honorable Mention) outperform low CSR firms. Honorable mention CSR firms have the best performance and supports findings of Bowman and	No adjustment for risk; employed t-test with very small sample; industrial categories are inconsistent. Many low CSR firms outperform high CSR firms in the same industry group; questionable sample; removal of outliers reduces greatly the differences between high and low CSR firms;

TABLE 1 (continued)

Study	Methodology	Performance Criteria	Findings Implications	Limitations
Sturdivant & Ginter (1977) (continued)	into four industrial groupings. CSR and the 10-year growth in EPS is examined.		Haire and to some extent that of Bragdon and Martin.	performance measure is questionable; failure to identify curvilinear relationship revealed in data between CSR and EPS.
Alexander & Buchholz (1978)	Replicating efforts of Vance by using reputational ratings derived from Business and Society Review surveys. CSR ratings are correlated with stock price increases over time and adjusted for risk.	Stock price increases over 2 years and 5 years	CSR has no effect on stock market performance; repudiates both Moskowitz and Vance.	Reliance on a questionable sample; performance measure is inadequate.
Abbott & Monsen (1979)	Development of a Social Involvement Disclosure (SID) scale from a content analysis of Fortune 500 firms. The SID is used to determine CSR firms, which are then compared on the basis of their investment yield.	10 year yield	CSR has no effect on the total return to investors.	No adjustment for risk; the SID may not reflect the true level of CSR; the content analysis used is superior to that of Bowman and Haire but is still questionable; performance measure is inadequate.

risk levels and degree of social responsibility. These findings suggest that the interpretations of both Moskowitz and Vance are invalid" (1978: 485).

Since the data were derived from both 3-year and 5-year assessment periods and were adjusted for risk, this study was a considerable improvement over its predecessors. However, as with the Vance study, the nature of the sample of firms remains a potential problem in that it relies upon the reputational studies and ratings provided by the *Business and Society Review*. In addition, the use of stock prices as the criterion for performance is undesirable given their inability necessarily to reflect on a firm's profitability.

Bowman and Haire (1975) conducted a study that used a different approach in investigating the issue of the relationship between corporate social responsibility and profitability. The researchers, in identifying firms as low or high in social responsibility on the basis of the number of lines devoted to the topic of social responsibility in their annual reports, point out that:

In searching for a readily available surrogate measure for actual activities in the area of corporate citizenship, we chose to measure the proportion of lines of prose in the annual report devoted to social responsibility. The annual report is a kind of projective test that allows a firm to express its goals and motives in much the same way that a Rorschach or TAT does for an individual A critic could immediately scoff at this measure. It is at least a popular belief that "everybody that talks about heaven ain't going there," that talk is cheap, and that talk about socially desirable behavior is not necessarily a predictor of such behavior (1975: 49-50).

To validate this line-count method, the researchers cross-validated it by applying the method to Moskowitz's 14 firms having high levels of social responsibility and found them to have much more line space devoted to the topic of social responsibility than the 14 other randomly chosen firms (1975: 51). Using this line-count procedure, the authors classified 82 firms into high, medium, and low social-responsibility categories, and then evaluated each category on the basis of 5-year return on equity (ROE). The researchers found that the firms with medium ratings for degree of corporate social responsibility performed the best and the firms with low ratings performed the worst, indicating a U-shaped relationship between corporate social responsibility and firms' financial performance (1975: 51-53).

Bowman and Haire's (1975) study exhibits numerous methodological problems. First, what is or is not a sentence or comment on corporate social responsibility can be difficult to ascertain, as the researchers themselves implicitly demonstrate (1975: 50). Second, the issue of validity also arises when assessment of corporate social responsibility is based on simple line count and cross-validated by 14 other firms whose level of social responsibility is also indeterminant, as we earlier observed. Third, the study included more (51) firms having low social responsibility than firms with moderate (18) or high (13) levels of social responsibility. Fourth, reliance on ROE as a measure of firm performance could be misleading since that return is a function not only of profitability, but also of a firm's financial leverage.

Finally, the researchers performed no significance tests, nor did they adjust performance for risk.

A subsequent study by Abbott and Monsen (1979) employed a similar but more sophisticated methodology. The researchers used a content analysis of *Fortune* 500 annual reports performed annually by the accounting firm of Ernst and Ernst. This content analysis involves 28 items monitored in the annual reports; the content analysis is then used to construct a Social Involvement Disclosure (SID) scale that Abbott and Monsen used as a surrogate for corporate social responsibility. They divided 450 firms from the *Fortune* 500 into high and low groups on the basis of this scale and then examined each group for profitability. They discovered little difference in investment yield between firms in the two groups, even when controlling for size. They concluded that: "Being socially involved does not appear to increase investor's total rate of return. Nor does it appear that being socially involved is dysfunctional for the investor" (1979: 514–515).

Some methodological problems exist with this study, as well. The annual report method used to assess corporate social responsibility may be superior to that used by Bowman and Haire, but it is still subject to validity problems. In addition, there was no adjustment for risk, and the performance criterion of investor's yield is not necessarily an adequate surrogate for profitability: yield is a function of both capital gains and dividends, neither of which need be tied directly to profitability.

Parke and Eilbirt (1975) conducted a study that took still another approach. In a previous study of corporate social responsibility the researchers had been able to get 96 firms from the *Forbes* 1971 Annual Directory to respond; they concluded that, since these firms had responded, they were clearly more oriented toward social responsibility than were nonrespondents. Parke and Eilbirt point out that:

The fact that all ninety-six of the replying firms identified themselves as engaged in endeavors associated with social responsibility suggests that firms not actively undertaking such work are more heavily represented among our nonrespondents (1975: 6).

They then compared 80 alleged socially responsible firms to the *Fortune* 500 firms (minus these 80 firms) on the performance criteria of dollar net income, profit margin, ROE, and earnings per share (EPS). The researchers conclude: "By all four measures, the 80 respondents who were considered to be the most socially active show up as more profitable" (1975: 8).

However, no significance test was performed, and it appears that the differences in both ROE and EPS are insignificant between the firms identified as socially responsible and other firms. Other methodological limitations exist. One problem was the assumption that the 80 firms in the sample had demonstrated a socially responsible orientation because they responded to a previous survey. Also, the data analysis methods were incomplete; there was no risk adjustment, and the profitability measures employed are not definitive and cover only one year.

Another major research effort in this area was based on the judgment of Moskowitz, who had classified 67 firms over time as essentially high, moderate, and low in corporate responsibility (Sturdivant & Ginter, 1977). The researchers note that:

The study was based on the sixty-seven corporations that had been cited by business journalist Milton Moskowitz as exhibiting exceptional social responsiveness or lack thereof. While no claim can be made about the accuracy of these ratings, they had the advantage of consistency in that they came from a single source (1977: 30).

Sturdivant and Ginter used this sample to derive yet a smaller 28 firm sample that they subdivided into four industrial groupings. They compared firms showing high, moderate, and low social responsibility in each grouping on the basis of 10-year EPS growth, and then normalized each firm by dividing growth by the industry average. They found that firms from the high and moderate groups outperformed those from the low group (1977: 38). However, Sturdivant and Ginter did not really mention the fact that firms in the moderate group were the best performers, a result similar to what Bowman and Haire had discovered earlier.

A number of methodological problems exist in this study, the first of which was sample selection: Sturdivant and Ginter derived their sample from a single source whose judgment was used in classifying the various firms in terms of orientation to corporate social responsibility. No criteria were offered for this classification. Moreover, the four industrial groupings reflect inconsistencies: for instance, Weyerhaeuser was grouped with U.S. Steel, Giant Food with S. S. Kresge Company, and Ralston Purina with Campbell Soup. In addition, the final sample, having been reduced to 28 firms, was small; there was no adjustment for risk; and the performance measure of growth in earnings per share is not definitive.

These studies reflect both varying methodologies and different degrees of rigor. Although reputational surveys and content analysis of annual reports do provide useful beginning points, other exploratory methods also exist. Also, it is surprising that so much research has been based on the value orientations of a single business critic, and that none of the studies used a financial performance measure, like return on assets, that is less susceptible to corporate manipulation. Only one study realized the critical importance of adjusting performance on the basis of risk. The two studies employing the most rigor (Abbott & Monsen, 1979; Alexander & Buchholz, 1978) found no relationship between corporate social responsibility and financial performance. However, two studies employing different methodologies (Bowman & Haire, 1975; Sturdivant & Ginter, 1977) found a curvilinear relationship between corporate social responsibility and financial performance, with moderately socially responsible firms being the best performers.

RESEARCH METHODOLOGY

In order to avoid some of the methodological problems of previous studies, we chose to develop a survey instrument capable of clearly assessing,

on a relative basis, a corporate respondent's social-responsibility orientation. The design and validation of the survey instrument was an important and indispensable part of this study; the basic approach used in constructing the instrument drew on Carroll's (1979) corporate social responsibility construct.

Carroll's Construct

The attractive feature of Carroll's (1979) construct was its definition of corporate social responsibility through four components; we saw this comprehensive quality as particularly conducive to the construction of a research instrument, and judged each of the components to be suitable for the kind of survey data we deemed desirable. The four components of the defining model are: economic, legal, ethical, and discretionary (or philanthropic) concerns. Carroll defines them as follows: (1) Economic responsibilities of business reflect the belief that business has an obligation to be productive and profitable and meet the consumer needs of society. (2) Legal responsibilities of business indicate a concern that economic responsibilities are approached within the confines of written law. (3) Ethical responsibilities of business reflect unwritten codes, norms, and values implicitly derived from society; ethical responsibilities go beyond mere legal frameworks and can be both strenuously undertaken and nebulously and ambiguously stated. (4) Discretionary responsibilities of business are volitional or philanthropic in nature, and, as such, also difficult to ascertain and evaluate.

With Carroll's (1979) construct, we could assess orientations toward social responsibility of corporate executives. In addition, use of the construct permitted inquiry into whether or not four separate components of corporate social responsibility exist, and, if they do, whether they exist in the weighted proportions implied by Carroll. His graphic representation of the four-part construct (1979: 499) suggested a weighting of 4-3-2-1, respectively, for the economic, legal, ethical, and discretionary components.

A Forced-Choice Survey Instrument

We used a forced-choice methodology to minimize the social desirability of responses. Respondents were asked to allocate up to 10 points to each of 20 sets of statements measuring corporate social responsibility. Each set contained four statements, each of which corresponded to one of Carroll's four components. Though all statements were unique, we asked respondents to respond repetitiously to slightly varying situations referring to corporate social responsibility. In other words, each set sought the same basic information.

Item Selection and Content Validity

Our first concern was content validity. To ensure the statements on corporate social responsibility were representative, an exhaustive list of statements representing the three non-economic components was derived from five studies — Eilbirt and Paret (1973), Corson and Steiner (1974), Paluszek

(1976), Holmes (1977), and Ostlund (1977). We took only items or statements rated as important by respondents in the former studies, and omitted industry-specific items in order to facilitate meaningful ratings from respondents regardless of industry association. Items selected to represent the economic performance component were drawn from performance measures typically found in corporate scoreboard sections of *Business Week* and *Forbes* and commonly referred to in well-established managerial finance texts. Altogether, we developed an inventory of 117 statements; each of the four components had its own pool of statements in this inventory. The 117 statements assessing corporate social responsibility were screened through a panel of six independent judges to ensure that statements in the instrument for each set actually represented Carroll's four components. The judges' task was to place each of the statements into one of the four categories, and to differentiate economic statements from non-economic statements. Consensus for a given statement was considered to exist when at least five judges concurred. This process produced enough statements to construct a 20-set, 80-item instrument. Since the ethical and discretionary statements produced less consensus, in a few instances high consensus statements from those two pools were used in more than one set. As statements were assigned to the various sets, three panel members reviewed the composition of each set to ensure the statements had relatively equal levels of social desirability. Statements were also randomly ordered to reduce response bias.

Reliability

We tested reliability by administering the instrument to 158 business policy students in four different classes at a large business school. Cronbach alphas calculated for each of the four categories of corporate social responsibility produced the following results: economic, .93; legal, .84; ethical, .84; and discretionary, .87.

The final questionnaire included additional questions in a Likert format including two questions that asked whether or not the respondents' organization engaged in social forecasting or had a corporate social responsibility committee on its corporate board.²

Instrument Mailing

We sent the final instrument, containing the 20 items assessing corporate social responsibility and other questions pertaining to both corporate social responsibility and to strategic management to the 818 chief executive officers (CEOs) listed in *Forbes 1981 Annual Directory*. A first mailing and two follow-up mailings generated 241 (30%) usable responses. Eight other responses were unusable, and 42 respondents indicated that they did not wish to participate in the survey.

²A copy of the main instrument can be obtained from the first author.

RESULTS

Factor Analysis

A factor analysis of the 80 item instrument was performed to determine whether the 4-part construct defining corporate social responsibility offered by Carroll could be supported. We used an N-factor, principal components factor analysis with a varimax rotation; it produced 22 factors with eigenvalues greater than 1.0. Further parsimony was required, particularly since the factor loadings for the 22 factors were low. Also, the eigenvalues and explained variances declined rapidly following the extraction of the first factor.

In order to identify the relevant number of factors inherent in the construct, we performed a scree test, which suggested that either three or four factors existed. We therefore performed both 3-factor and 4-factor principal component factor analyses.³

We judged the 3-factor solution to be the one that produced the more practical results because in it, 59 of the statements assessing corporate social responsibility had dominant loadings, considerably more than we found with the 4-factor solution.

One factor contained both highly negative economic loadings and highly positive ethical loadings. This pattern supported the validity of the four-part corporate social-responsibility construct, but also produced an unanticipated revelation: a clear inverse relationship between the economic and ethical dimensions, implying that an emphasis on one of these two components was primarily at the expense of the other. Apparently, the more concerned a corporation was with its economic responsibilities, the less interested it was in its ethical responsibilities. Considering the amount of support given in recent years by both business leaders and social critics to the topic of ethical behavior, we found this result somewhat surprising.

Table 2 presents zero-order correlations among the four component scores; Cronbach alpha coefficients are in the diagonal cells. As would be expected from the factor structure, the strongest correlation ($r = -.71, p = .001$) was between the economic and ethical components. In fact, the economic factor correlated negatively with all three of its non-economic counterparts. Generally, our analysis supported the existence of four distinct, but related, components. In addition, the relative values or weights of each of the components, as implicitly depicted by Carroll, approximated the relative degree of importance the 241 executives placed on the four components. The mean scores for each component were: economic = 3.50, legal = 2.54, ethical = 2.22, discretionary = 1.30.

Partitioning the Four Components

For purposes of later analysis, we rearranged the four components assessing corporate social responsibility into two categories. The first category,

³The results of these factor analyses can be obtained from the first author.

TABLE 2
Intercorrelations Among the Four Components
of Corporate Social Responsibility^a

	1	2	3	4
1. Economic	.90 ^b			
2. Legal	-.48***	.86		
3. Ethical	-.71***	.13*	.87	
4. Discretionary	-.47***	.04	.25**	.84

^aN = 241

^bValues on diagonal are Cronbach alphas.

*p < .05

**p < .01

***p < .001

denoted as "a concern for society," consisted of the three non-economic components (legal, ethical, and discretionary). We labeled the remaining, economic component a "concern for economic performance." This dichotomy is not uncommon, for social responsibility is often seen as combining the legal, the ethical, and the philanthropic. The social orientation of an organization can be appropriately assessed through the importance it places on the three non-economic components compared to the economic. For instance, we considered high concern-for-society scores for an organization to indicate a strong orientation toward social responsibility.

Corporate Performance Criteria

To ascertain the relationship between corporate social responsibility and profitability, it was necessary to correlate a firm's concern for society score with its profitability. The profitability indicator used was return on assets (ROA); we employed both short-term (one year) and long-term ROA (five year). However, in order to rely on this indicator as our performance criterion, we had to adjust it for risk propensities typical of various firms and industries. We took our adjustments from *Value Line*, which publishes betas and safety measures for most large corporations. Although these measures pertain directly to risk in regard to a firm's stock, they also reflect the firm's general risk characteristics. *Value Line's* safety index is perhaps the most comprehensive among measures of total risk confronting a firm, since it incorporates the beta and many other factors as well. *Value Line* observes that the safety index is:

a measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which the Beta is a good risk measurement). Safety is based on the Stability of price (which includes sensitivity to the market — i.e., Beta — as well as the stock's inherent volatility) adjusted for trend and other factors — including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the

balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). (1981, part IV: 7)

To standardize a firm's return on assets, we first averaged its safety index figures for five years. We then divided this measure by three, the Value Line average safety index, and divided this result into the ROA. For instance, if a firm's safety index figure over five years were 3,4,3,4, and 3, the average would be 3.4. Because 3.4 would be slightly above the risk norm, and since greater levels of risk require greater compensating payouts, we would adjust such a firm's ROA of (say) 20 percent downward by dividing it by 1.1 ($3.4 \div 3$), bringing the risk-adjusted ROA of that firm down to 19 percent. An average safety index of 1 would also need to be divided by 3, yielding an adjustment factor of .333, to be divided into an ROA of (say) 7 percent. Adjusting ROA for risk, the second firm would have higher performance: a 21 percent versus a 19 percent risk-adjusted ROA. This method, though uncommon, serves the purpose of standardizing the ROA so that firms can be compared with one another.

Analyses of Performance

Table 3 shows that no statistically significant relationships were found between a strong orientation toward social responsibility, or concern for society, and financial performance. It did not matter whether short-term or long-term ROA were used, nor did it matter if that indicator were adjusted or unadjusted for risk. We concluded that it was not possible to support the notion of a positive or negative relationship between profitability and an orientation toward corporate social responsibility, results that are basically consistent with Arlow and Gannon's (1982) conclusion that research studies have not provided strong support for a positive association between profitability and corporate social responsibility. The present study also suggests that it is neither beneficial nor harmful for a firm to be socially motivated to fulfill its social contract.

The results displayed in Table 3 parallel other empirical findings derived with our research instrument. For instance, the instrument examined two issues related to the social orientation of an organization. One question

TABLE 3
Relationship of Concern for Society
with Financial Performance and Risk

Predictors	N	r	p
Long-term return on assets	174	.00	.99
Risk-adjusted, long-term return on assets	166	.11	.16
Short-term return on assets	228	.10	.15
Risk-adjusted, short-term return on assets	192	.13	.08
Five-year total risk	189	-.17	.02
Long-term beta	189	-.08	.25

regarding organizational policy involved determining whether social forecasting was employed. Another question addressed whether there was a corporate social responsibility committee on the board of directors.

The results shown in Table 4 clearly suggest that firms that employ social forecasting are not different from firms that do not in regard to long-term profitability, with or without an adjustment for risk. The same results also appear to be true for the related category concerning corporate social responsibility committees on boards of directors. The results shown in Table 5 reveal no statistically significant differences in regard to adjusted or unadjusted profitability. We concluded that firms with a corporate social responsibility committee on their boards did not differ in profitability from other firms.

DISCUSSION

The review of the literature on the relationship between corporate social responsibility and profitability showed that the studies produced varying results. Although many studies concluded that a relationship existed, those studies that appeared to be most methodologically sound did not reach that

TABLE 4
Relationship between Employing Social
Forecasting and Profitability of Firms

Firms	N	Mean	t	p
Firms employing social forecasting	69	10.83 ^a	-.59	.550
Remaining firms	111	11.27 ^a		
Firms employing social forecasting	68	15.56 ^b	1.16	.250
Remaining firms	103	13.40 ^b		

^aLong-term return on assets.

^bRisk-adjusted, long-term return on assets.

TABLE 5
Relationship between Presence of Corporate
Social Responsibility Committee on Board
and Profitability of Firms

Firms	N	Mean	t	p
Firms with CSR committees	53	10.43 ^a	1.18	.24
Remaining firms	127	11.39 ^a		
Firms with CSR committees	53	14.60 ^b	-.02	.98
Remaining firms	118	14.63 ^b		

^aLong-term return on assets.

^bRisk-adjusted, long-term return on assets.

conclusion. The current study is also unable to support the notion that such a relationship exists.

This study has made an attempt to avoid some of the problems that existed in earlier studies. Rather than relying upon methodologically weak mechanisms by which to determine the social orientation of an organization, we used an elaborate forced-choice instrument to examine the relationship between an orientation toward corporate social responsibility and profitability. The structure of the survey instrument not only minimized the degree of response bias, but facilitated our observing how much relative importance an organization placed on both the non-economic and the economic. We found it interesting that many executives wrote on their questionnaires that it was unfair that they had to make unpleasant choices. For instance, respondents commonly noted that all categories were attractive or important to them. They clearly indicated a dislike for the forced-choice procedure, which, they felt, constrained their responses — in actuality, it limited their bias.

Since the instrument itself was embedded in Carroll's (1979) four-part model defining corporate social responsibility, it was imperative that this construct's validity be examined as well. The results of the content validity studies appear to support both model and instrument. First, the studies indicated that "experts" were capable of distinguishing among the four components when sorting written statements reflecting each component. Second, we concluded, from our factor analyses, that there are four empirically interrelated, but conceptually independent, components of corporate social responsibility. Third, a test of discriminant validity for an instrument developed to represent those components clearly identified the components for 59 of the 80 statements used in the study, and in addition, two separate studies verified the internal consistency of each component as a reflection of aspects of corporate social responsibility.

Our results also give tentative support to the relative weightings Carroll (1979) assigned to each of the four components. Although the mean scores used to determine these weightings were rather crude indicators, their relative magnitude and order confirmed that, at least for 241 active CEOs or their designated associates, Carroll's weightings were close approximations. We were interested in seeing that, although respondents clearly placed more emphasis on the economic component, the non-economic component means taken together (6.06) were of much greater weight than the mean for the economic component (3.50). Perhaps this suggests the corporate community is more responsive to social issues than has been suspected.

The research inquiry also produced an unanticipated finding. Apparently, there is a strong inverse relationship between the economic and ethical components, as the factor analysis made clear, with the economic component loading negatively on one factor and the ethical component loading positively on the same factor. In addition, strong negative correlations between the economic and each of the three non-economic components suggest that the more economically oriented a firm is, the less emphasis it places on ethical, legal, and discretionary issues, a particularly interesting finding,

given the fact that the three non-economic components had modest or insignificant correlations among themselves. The correlations among these components showed few substantive relationships from the emphasis respondents placed on them. Consequently, the results indicate that CEOs make fairly unambiguous negative associations between economic and non-economic components taken together, but make few associations among the non-economic components themselves.

In addition to using a more objective social orientation measurement technique than former studies, we employed more representative profitability criteria. Many of the earlier studies relied upon profitability measures of less definitive value than ours when performing inter-company comparisons. We used return on assets in this study because we thought, as a standard means of assessing profitability on a relative basis, it was more universally acceptable and less likely to produce misleading results than other measures. We used both short-term (one year) and long-term (five year) return on assets, adjusted for risk.

When correlating orientation toward social responsibility, a "concern for society," with profitability, we observed no statistically significant relationships. Much the same was also discovered when surrogate measures for this orientation were used. The profitability of firms that did social forecasting was not found to be statistically different from that of firms that did no forecasting. In addition, the profitability of firms having a corporate social responsibility committee on their corporate boards did not significantly differ from that of other firms. It seems that there is insufficient evidence to support the claim that socially responsible firms are more profitable than other firms.

There are many other methods available to assess the relationship between corporate social responsibility and profitability. Some studies have chosen to measure managers' behavior, commitment, or reputations in regard to their orientation toward social responsibility; this study assessed CEOs' orientations. Consequently, the findings of this study are limited, in part, to the perceptions on corporate social responsibility of CEOs or their delegated representatives. It is possible that CEOs are not representative of their organizations and that the research instrument should instead be administered to several employees of each organization surveyed.

Still, this study has not been able to corroborate the claims of either advocates or critics as to the value social responsibility may have for industrial organizations. Perhaps its merits simply do not show up on the "bottom line;" perhaps superior methodologies or new qualitative approaches are required. It could very well be that the intangible benefits of corporate social responsibility tend to evade scientific inquiry. Perhaps this issue, whether or not corporate social responsibility is related to profitability, will never be completely resolved.

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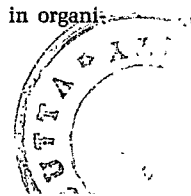
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RESEARCH NOTES

EMPLOYEE ABSENTEEISM: THE ROLE OF EASE OF MOVEMENT

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Because studies have provided only weak and inconsistent support for a relationship between degrees of job satisfaction and absenteeism, some researchers have advocated reconceptualizing absenteeism as a function of both work and nonwork factors (Johns & Nicolsen, 1982; Youngblood, 1984). One extraorganizational factor that has been identified as possibly bearing on attendance is perceived ease of movement from the employing organization — that is, individuals' preceptions of the attractiveness and availability of alternative employment opportunities. Ease of movement is an integral part of models of employee turnover (March & Simon, 1958; Mobley, Griffeth, Hand & Meglino, 1979), and several researchers have speculated that it may also have important implications for temporary forms of withdrawal like absenteeism.

Steers and Rhodes (1978) described attendance behavior as a function of both motivation to attend and ability to do so. Ease of movement should affect motivation to attend: if it is low, pressure to maintain a good attendance record would be high because lack of attractive alternatives would exacerbate the consequences of losing a job. Research demonstrating an inverse relationship between levels of unemployment in a geographical region and subsequent absenteeism in that region (Behrend, 1951, 1953; Crowther, 1957) has provided evidence in favor of the impact of external mobility on absenteeism at the aggregate level. This line of reasoning suggests that ease of movement has a direct, positive effect on absenteeism.

However, the literature on employee withdrawal contains interpretations of the relationship between ease of movement and absenteeism that are made complex than the reasoning just summarized. First, Porter and Steers (1973), among others (Johns & Nicholsen, 1982; Mobley, 1977), have suggested that absenteeism often represents a substitute for resignation when other employment is not available. Discussions of the potential positive consequences of turnover have taken this line of reasoning, offering the argument that it may be better for organizations to lose disgruntled employees

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than to incur the ongoing costs of substitute forms of employee withdrawal (Dalton & Tudor, 1979; Staw & Oldham, 1978). According to this substitution-frustration proposition, ease of movement would moderate absenteeism, and a higher rate of absenteeism would occur among employees who wished to leave their jobs but saw few or no acceptable alternatives than among those who saw themselves as having alternatives.

The withdrawal progression hypothesis suggests yet another prediction. Herzberg, Mausner, Peterson, and Capwell (1957) argued that withdrawal is progressive, with absenteeism and lateness being precursors to job resignation. Though results of research on this hypothesis have been mixed (Clegg, 1983), there is some evidence that absenteeism is associated with the quitting process (Burke & Wilcox, 1972; Waters & Roach, 1979). When the withdrawal progression hypothesis and the tenet that both desire and opportunity to leave precede voluntary turnover (March & Simon, 1958) are combined, they suggest a different type of moderating effect. Specifically, they imply that the highest rates of absenteeism will occur among employees who are the most prone to quit their jobs — that is, those who both wish to leave their organization and believe they are externally mobile.

To date, no one has tried to investigate the substitution-frustration proposition or to assess the direct effect of ease of movement on absenteeism. The present study addresses these issues by examining (1) the direct relationship between ease of movement and absenteeism, and (2) the moderating effect that perceived ease of movement has on the relationship between desire to remain with an organization and attendance. We hope to clarify the significance of ease of movement for absenteeism as well as to provide insight into various models of withdrawal.

METHODS

Subjects

This study used data collected from 104 blue collar workers engaged in the transportation functions of a large eastern newspaper and from 132 registered nurses employed at a medium-sized northwest hospital. Both groups were unionized, but, not surprisingly, there were significant differences in their demographic profiles. All of the newspaper workers were men and 92 percent of the hospital nurses were women; the average age of the newspaper workers was 29 and the average age for the nurses was 32; finally, 88 percent of the nurses had achieved at least a college degree, but only 9 percent of the newspaper workers had done so.

Measures

We used a survey questionnaire to collect data on employees' desire to remain with their organizations and on their perceived ease of movement from their organization, administering the questionnaire in small groups and on company time. Individual absenteeism data came from company records.

A modified version of a commitment index developed by Alutto, Hrebiniak, and Alonso (1973) measured desire to remain with an organization. The six-item scale assessed how willing respondents would be to leave their present organization for a similar job elsewhere that offered such inducements as slightly more pay and a more attractive geographical location (newspaper, $\alpha = .89$; nurses, $\alpha = .88$).

A five-item scale measured ease of movement by ascertaining respondents' perceptions concerning (1) the probability of their finding an acceptable alternative job, (2) the number of similar and more attractive opportunities available, and (3) the time necessary to find an acceptable alternative (newspaper, $\alpha = .77$; nurses, $\alpha = .85$).

We collected individual absenteeism data six months before and six months after administering the survey. We distinguished between excused and unexcused absenteeism according to the classification each organization used; both classified reported illness, injury, and personal reasons (i.e., extended vacations, domestic problems) as excused absences and classified incidents of employees failing to notify management that they would not be at work as unexcused absences. For the newspaper workers, we also got data on tardiness, but did not for the hospital group. Following recommendations made by Hammer and Landau (1981), we calculated individual rates of absenteeism on an annual basis according to the number of times a person was absent or late.

As current research has emphasized the impact of organizational policies on levels of absenteeism (Dalton & Perry, 1981; Jones & Nichol森, 1982), we will describe relevant regulations in detail. Newspaper employees were granted 14 paid sick days per year and the nurses were allotted 12 sick days. Neither organization required medical verification, though the newspaper management requested such information when an absence lasted more than two days. Neither organization granted compensation for unused sick leave. The newspaper contract provided for a three-day layoff following a second incident of nonexcused absenteeism or lateness; management could terminate employment after the fourth such incident. For the nurses, supervisory reprimands and counseling followed incidents of nonexcused absenteeism, with management reserving the right to terminate employment for poor attendance.

Methods of Analysis

We used zero-order correlations and hierarchical regression analysis to assess support for direct and moderating effects (Arnold, 1982). The prescribed order of predictors in the regression equation, based on Steers and Rhodes's (1978) attendance model, was (1) desire to remain, (2) ease of movement, and (3) the interaction term—desire \times ease. Although discovering significant interaction effects would provide support for a moderating relationship, it would not reveal the precise nature of this effect. In order to shed light on this key question, we split each subject group in terms of high and low responses to the desire-to-remain and ease-of-movement instruments,

and plotted the mean level of absenteeism for each of the four subgroups in order to discern the pattern of significant interaction effects.

RESULTS

Table 1 presents the intercorrelations and hierarchical regression results for absenteeism and lateness. Several correlations are of interest. First, desire to remain was significantly and inversely related to excused absenteeism in both groups but had no significant associations with unexcused absenteeism and lateness. Perceived ease of movement was also significantly related to excused absenteeism in both groups, but it, too, had no significant associations with unexcused absenteeism, although it was positively related to lateness for the newspaper sample.

We obtained significant regression results for excused absenteeism but not for unexcused absenteeism, a pattern consistent with the correlational results. Both ease of movement and the interaction term added significantly to explained variance for excused absenteeism in both groups; moreover, ease of movement was the only predictor to contribute significantly to explaining lateness. In order to assess the relative contributions of each predictor for excused absenteeism, we conducted a secondary analysis using standard regression procedures. In this analysis the contribution of desire to remain was trivial; ease of movement and the interaction term were the only significant predictors, together explaining 10 percent of the variance in excused absenteeism for the newspaper workers and 11 percent for the nurses.

Figure 1 displays the pattern of significant interactions for excused absenteeism with each group categorized according to high or low desire to remain and high or low perceived ease of movement. A substantially higher rate of excused absenteeism occurred among newspaper employees with a low desire to remain and high ease of movement than among all others in that group of respondents; negligible differences appeared in the absenteeism rates of the other three newspaper groups. This pattern was replicated for the hospital nurses. We found no support for the proposition that less committed employees with low ease of movement will exhibit a higher incidence of absenteeism than other employees — in fact, this subgroup exhibited the lowest level of excused absenteeism in both groups.

DISCUSSION

Having two separate groups of subjects for cross-comparison gave this study a major advantage over most previous research on absenteeism. The same pattern of results appeared in two groups that differed as to demographic characteristics and organizational setting; this extends the generalizability of our findings. Some caution, however, may be in order, since both groups were unionized and the two organizations employed similar absenteeism policies. We suggest replication in nonunionized settings with different regulations regarding absenteeism.

TABLE 1
Zero-Order Correlations and Hierarchical Regression
Results^a for Absenteeism and Lateness

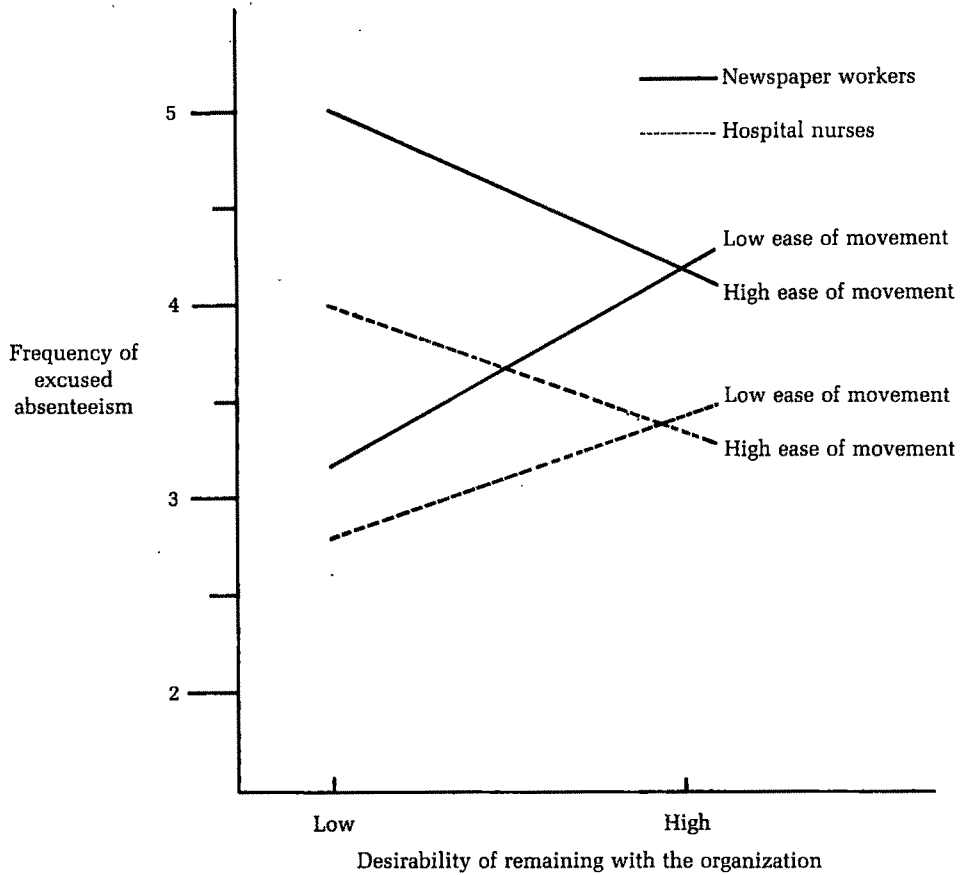
Predictors	\bar{X}	s.d.	Excused Absenteeism		Unexcused Absenteeism		Lateness	
			r	R^2	r	R^2	r	R^2
Newpapers workers ($n = 104$)								
Desire to remain	19.2	6.21	-.205*	.042*	-.097	.009	-.020	.000
Ease of movement	16.2	7.84	.274**	.033*	.063	.002	.211*	.042*
Interaction: Desire \times ease				.030*		.003		.012
Total R^2				.105*		.014		.054*
Hospital nurses ($n = 133$)								
Desire to remain	21.3	7.53	-.221**	.049*	-.111	.012		
Ease of movement	20.1	8.63	.287**	.041*	.121	.009		
Interaction: Desire \times ease				.034*		.013		
Total R^2				.124**		.034		

^aIncremental R^2 with prescribed order: (1) desire to remain, (2) ease of movement, (3) interaction.

* $p < .05$

** $p < .01$

FIGURE 1
Interactions Between Desire to Remain
and Ease of Movement for Excused Absenteeism



One of the interesting aspects of this study was that perceived ease of movement was significantly related to excused absenteeism but not to unexcused absenteeism. Researchers have generally suggested that negative job attitudes and perceptions affect unexcused absenteeism more strongly than excused absenteeism (Chadwick-Jones, Brown, Nicholson, & Sheppard, 1971; Garrison & Muchinsky, 1977). One possible explanation for our finding may be that the low degree of variance in the nonexcused absenteeism measures created problems of restricted range. Differences in the severity of the consequences of the two types of absenteeism (Morgan & Herman, 1976) provide another possible explanation. In both organizations, suspensions and termination deterred chronic unexcused absenteeism, but, in contrast, paid sick days sanctioned excused absenteeism. Dalton and Perry (1981) have argued that such sick leave policies actually encourage absenteeism by making it

cost little for employees. Consequently, the rate of excused absenteeism is more likely to reflect motivation to attend than is the rate of unexcused absenteeism, which is more costly to employees.

Findings regarding the moderating effect of ease of movement tend to support the withdrawal progression hypothesis. Organizational policies on unused sick leave may have been a factor here; failure of either organization to compensate unused sick leave probably accentuated the interaction effect. Still, the modest size of this effect suggests that progressive withdrawal accounts for only a limited proportion of employee absenteeism.

The lack of support this study provided for the substitution-frustration proposition implies that employers do not need to be overly concerned that the dissatisfaction of employees who are essentially trapped by an absence of alternatives will manifest itself in dysfunctional behavior. Perhaps, over time, disenchanted employees with limited alternatives even develop more favorable attitudes toward an organization as an adaptive reaction. This, however, may prove to be an oversimplification of a complex accommodation process, and alternative responses need to be investigated (Steers & Mowday, 1981).

The central thrust of this research was not prediction, but rather assessment of theoretical propositions concerning the relationship between ease of movement and absenteeism. Still, the combined direct and interaction effects of perceived ease of movement that we found explained a degree of variance in excused absenteeism that is quite credible when we compare our study with extant research. Furthermore, the effect of desire to remain was dependent upon levels of ease of movement, suggesting a possible explanation for inconsistent findings surrounding the satisfaction-absenteeism relationship. For example, when ease of movement is low, the relationship between absenteeism and satisfaction might disappear because absence levels will be depressed. The present study not only highlights perceived ease of movement as a predictor of absenteeism but also shows the need to further examine the interaction between extraorganizational factors and traditional job-related predictors of absenteeism.

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A STUDY OF THE CORRELATES OF THE WILLINGNESS TO RELOCATE

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This paper investigates correlates of employees' willingness to relocate to other cities or states for career enhancement. Employees' attitudes toward relocation to other geographic areas are important for at least three reasons: (1) employers use employee transfers as a strategy for staffing organizations and developing managers (Carruthers & Pinder, 1983); (2) relocation may be a useful strategy for personal career enhancement (Hall, 1976); (3) there is some evidence indicating that workers are becoming less willing to geographically relocate for career reasons (Magnus & Dodd, 1981).

A review of the literature suggests that two classes of variables may be related to an individual's willingness to relocate. These are: (1) time-based variables — age, length of time in the job, and length of time living in the area; and (2) situational variables — salary, job involvement, family status, and spouse's employment status.

As the length of time an individual has lived in an area increases, the area's attractiveness may increase. Over time, a person is likely to become increasingly integrated into the social structure of a community (Swanson, Luloff, & Warland, 1979). Hence, willingness to relocate should decline as the length of time an individual has lived in an area increases.

Another time-based factor is age. Veiga (1983) reports that propensity to change jobs within the same geographical area lessens with increased age. We therefore also expect that willingness to relocate to another geographical area will decline in later career stages.

A third time-based factor, length of time in the job, has been linked with low upward mobility (Ferrence, Stoner, & Warren, 1977). Veiga (1983) reports that average length of time in a job has a small but significant negative correlation with the propensity to change jobs within the same geographical area. Hence, it is likely to be negatively associated with the willingness to relocate as well.

Situational factors include job-related factors and family-related factors. Two job-related factors that may be related to willingness to relocate are salary level and job involvement. Salary may be positively related to the willingness to relocate for two reasons: (1) individuals with high salaries may be in a better position to receive relocation opportunities than are employees with low salaries, as the first group has higher exposure and visibility (Hall, 1976); (2) relocation involves some degree of financial risk (Magnus &

Dodd, 1981), including unrecoverable moving expenses. Clearly, persons with higher salaries are more likely to have the surplus financial reserves needed to cover the financial risks of relocation than are those with lower salaries. Hence, we predict that high salary level will be positively related to willingness to relocate.

Job involvement is another factor that is likely to be related to willingness to relocate. Job involvement, as defined by Lodahl and Kejner (1965), entails a strong attachment to a job, which should be reflected in a low willingness to relocate.

Two family-related factors are: (1) spouse's work status, and (2) family status. Several writers (e.g., Maynard & Zawacki, 1979) argue that individuals in families having two wage earners are less likely to relocate since a relocation would jeopardize the spouse's income-earning potential. Hence, we predict that persons in such families will be less willing to relocate than those who are sole wage earners for a family.

Family status may also be related to willingness to relocate. Gould and Werbel (1983) have shown that the presence of children in families having two wage earners is related to increased involvement in a job and identification with an organization. Additionally, parents of teenage children may hesitate to relocate because their children may be hurt socially by a move (Veiga, 1983). Hence, it is anticipated that willingness to relocate will be lower when there are children in the home.

In summary, we hypothesize that willingness to relocate will be negatively related to age, length of time in the job, and the length of time living in the area, and positively related to high salary level and job involvement. Finally, it is hypothesized that willingness to relocate will be lower in families having two wage earners than in families having only one wage earner, and that it will be lower in families with children than in families with no children.

METHODS

Sample and Procedure

The sample consisted of 192 men employees of a large municipal organization in the southwest. Data were gathered as part of a larger study of career attitudes which included 453 employees.

Occupations included in the study all offer workers potential for upward mobility; subjects were sales workers, technicians, professionals, and managers. Because of the small number of women in the sample and the impossibility of measuring the impact of dual-wage-earner status on this group (there were no married women in single-wage-earner families), women were dropped from the analysis. The mean age of subjects was 40.4 years. On average, respondents had lived in the community for 27.42 years (*s.d.* = 13.42). Respondents averaged 6.27 years in their current jobs. Fifty-six percent of the subjects' spouses were also employed.

The community, located in a large metropolitan area in the southwestern United States, rates high in terms of quality-of-life factors (Peirce & Hagstrom, 1983) and is part of the economically developing sunbelt area. It is therefore an area attractive to its residents.

Measures

Willingness to relocate. This measure consisted of the sum of responses to three items on six-point Likert scales, anchored at the left by strongly disagree and at the right by strongly agree. A sample item was: "I would leave (name of city) if a better job opportunity arose in another (name of state) city." ($\bar{X} = 9.09$; $\alpha = .91$).

Job involvement. Job involvement was measured by six items recommended by Lodahl and Kejner (1965) ($\alpha = .78$).

Family status. Family status was a categorical variable fashioned after Hall's family stages (Hall, 1976). Categories and their respective codes were: (1) no children present; (2) children of preschool and elementary school age; (3) children of junior/senior high school age; (4) only adult children.

Spouse's work status. This was a dummy variable coded as 0 if the subject's spouse was not employed outside the home and 1 if the subject's spouse was employed outside the home.

Salary, age, length of time in job, and length of time in area. These variables were obtained from responses to objectively worded questions.

RESULTS

Table 1 shows that low to moderate correlations exist among the variables. The diagonal elements of the inverse correlation matrix for the independent variables (Pedhazur, 1982: 232) suggested generally low collinearity among the independent variables. Willingness to relocate was significantly associated with spouse's work status, age, job involvement, and length of time in the area.

Since the relationship between willingness to relocate and family stage need not be linear, analysis of variance was employed to investigate the relationship between these two variables. Table 2 reports the results of an analysis of covariance with willingness to relocate as the dependent variable, family stage as the independent variable, and age as a covariate. Family stage was not related to willingness to relocate in this study. For further analyses, we employed a dichotomous category of (1) no children in the home and (2) children in the home.

Table 3 reports the results of a stepwise multiple regression with willingness to relocate as the dependent variable. The equation has an R^2 value of .18, indicating that approximately 18 percent of the variance in willingness to relocate was accounted for. Only one variable, family status, did not have a beta weight significantly different from zero. Two of the time-based variables were related to the willingness to relocate as anticipated. With greater time in the area and older age, respondents were less willing to relocate ($\beta = -.27, p < .001$ and $\beta = -.26, p < .01$, respectively). These results are consistent with the community integration and career stage hypotheses advanced earlier.

TABLE 1
Means, Standard Deviations, and Pearson
Correlations of All Variables
(*n* = 192)

Variables	Means	s.d.	1	2	3	4	5	6
1. Willingness to relocate	9.09	4.92						
2. Salary	1244.39	424.27	.00					
3. Length of time in job	6.27	5.44	-.01	.24*				
4. Spouse's work status ^a	0.56	.50	.23*	-.16*	.01			
5. Age	40.41	10.56	-.18*	.43*	-.24*	.00		
6. Job involvement	23.31	5.74	-.20*	.31*	.09	-.21*	.14	
7. Length of time in area	27.42	13.42	-.28*	.13	.33*	-.06	.15*	.21*

^aDummy variable, with 1 = spouse employed.

**p* < .05

TABLE 2
Results of Analysis of Covariance with Willingness
to Relocate as the Dependent Variable
(*n* = 192)

Source	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>
Covariate					
Age	1	203.34	203.34	8.411	.01
Main effects					
Family stage	3	49.25	16.42	.68	n.s.
Residual	187	4375.70	25.02		

TABLE 3
Stepwise Multiple Regression with Willingness to Relocate
as the Dependent Variable
(*n* = 192)

Variables	Beta	<i>t</i>	<i>p</i>	<i>R</i> ²	ΔR^2
Length of time in area	-.28	-3.85	.001	.08	.08
Spouse's work status	.15	2.06	.05	.12	.04
Job involvement	-.14	-1.90	.10	.13	.01
Salary	.18	2.29	.05	.14	.01
Age	-.25	-2.89	.01	.16	.02
Length of time in job	.14	1.80	.10	.18	.02
Family status	-.08	-1.15	N.S.	.18	.00

With age and time in the area held constant in the multivariate analysis, there was a modest positive relationship between length of time in the job and willingness to relocate that contradicted the predicted negative relationship. It may be that employees in this sample who had been longest in their jobs were prematurely plateaued by a lack of opportunities to move up within their current organization. These individuals may have seen relocation as their primary means for satisfying a pent-up desire for further advancement.

Among the situational variables, the relationship between a spouse's being employed and willingness to relocate was in a positive, rather than a negative, direction. These results are consistent with Blomquist (1982), who found families with two wage earners to be represented among relocated personnel at a level consistent with their representation in the labor force as a whole. There are several reasons why this relationship may be positive: (1), families with multiple wage earners may be in better position to finance a move; (2) employees in dual-wage-earner families are reported to have lower organizational involvement than persons in single-wage-earner families

(Gould & Werbel, 1983), and so have less attachment to their current job and community. It is likely that the relationship between dual versus single-wage-earner status and the willingness to relocate may be more complex than initially thought.

Job involvement was negatively related to the willingness to relocate. As anticipated, involved individuals were less likely to consider relocation as a means of increasing career options. Also, as predicted, in the multivariate analysis, high salary was positively related to the willingness to relocate, indicating support for the notion that high salaried persons are more likely to consider relocation opportunities than those with low salaries.

CONCLUSIONS

The results of this study suggest that the relationship between career and geographic mobility is complex. As expected, length of time in area, age, and job involvement were negatively associated with the willingness to relocate. High salary, length of time in the job, and dual career status were positively associated with willingness to relocate. The salary relationship is predictable on the basis of the financial security of the high salaried employee; however, the relationship between length of time in the job and willingness to relocate may be sample-specific. Finally, it is noteworthy that employees with working spouses had a higher willingness to relocate than those whose spouses did not work outside the home. Given the greater financial security and lower organizational involvement of the dual-wage-earner employee, this finding may merit further investigation.

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PREDICTING EMPLOYEE TURNOVER FROM LEADER-MEMBER EXCHANGE: A FAILURE TO REPLICATE

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A somewhat promising new direction for studying the influence of leadership on employee turnover has been suggested by Graen, Liden, and Hoel (1982). From the perspective offered by the vertical-dyad linkage model (Dansereau, Cashman, & Graen, 1973; Dansereau, Graen, & Haga, 1975; Graen & Cashman, 1975), they hypothesized that the quality of leader-member exchanges would predict employee turnover. Further, they hypothesized that the predictive utility of an approach that focuses on individual leader-member exchanges would exceed the predictive utility of an average leadership approach (i.e., a between-groups focus). Recent studies (Katerberg & Hom, 1981; Vecchio, 1982; Vecchio & Gobdel, 1984) that indicate that within-group differences in leadership can account for significant proportions of variance on affective measures offer an empirical base supporting this second hypothesis.

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In a test of these hypotheses, Graen et al. (1982) attempted to predict individual employee turnover (over a 1 year period) from attitudinal data on leader-member exchange. Their sample consisted of 48 systems analysts and programmers representing three hierarchical levels of an information systems department in a public utility. Overall, the results Graen and his colleagues obtained indicated that leader-member exchange was a stronger predictor of turnover than data reflecting average leadership style, as the former accounted for roughly three times more criterion variance than did the latter. In addition, these investigators judged the predictive utility of leader-member exchange, demonstrated via a hit-rate analysis, to be superior to the predictive utility of an average leadership approach. From these results, Graen et al. concluded "... that it is the unique exchange that develops between a leader and member, not a leader's overall style that influences a member's decision to remain in the organization" (1982: 871). The present study does not hypothesize that within-unit variance is a better predictor than between-unit variance, but instead that both sources of variation may be valid predictors. The findings of Graen, Liden, and Hoel (1982) suggest that within variance may be a valid predictor of turnover.

The present investigation attempts to replicate their findings for a sample of fairly low-level operatives (bank tellers). Such a sample allows control for differences in job function, as well as for differences in job level and such concomitant outcomes as pay and autonomy; controlling for these variables is important because all are generally accepted as being related to employee turnover (Mobley, Griffeth, Hand & Meglino, 1979; Ross & Zander, 1957; Taylor & Weiss, 1969; Waters & Roach, 1971). The presence of different job functions and levels in the Graen et al. sample raises the possibility that their supportive findings may be partially due to sample-specific attributes and relationships.

METHODS

Setting and Measures

The study involved bank tellers who were employed in twelve branches of a medium-sized bank in the Midwest. The branches employed an average of 3.75 tellers (the range was 2 to 6, inclusive). The group-level unit of conceptualization was represented by the individual branches (viz. workgroups within a single department, Graen et al. 1982). Of 47 tellers who were contacted through a confidential mailed questionnaire, 45 provided usable data via return mail.

The questionnaire included the following instruments: (a) subordinate satisfaction with supervision — Job Descriptive Index subscale (Smith, Kendall, & Hulin, 1969), $\alpha = .84$; (b) two measures of overall job satisfaction (Brayfield & Rothe, 1951), $\alpha = .82$, and an 11-point faces scale (Kunin, 1955); and (c) the 4-item version of the negotiating latitude scale ($\alpha = .64$), hereafter

referred to by Graen et al.'s (1982) label of leader-member exchange.¹

When one year had elapsed after the collection of the attitudinal data, the director of personnel of the bank was asked to provide an employment status classification for each employee. Each of the 45 tellers was classified as an instance of involuntary turnover ($n = 2$), voluntary turnover ($n = 12$), or currently employed ($n = 31$). Separate analyses were performed with the involuntary turnover subgroup excluded and included. The inclusion of the subgroup did not alter the results. Therefore, the following analyses are reported for the entire sample of respondents ($n = 45$).

Analytic Techniques

Following the procedures Graen et al. (1982) employed, average leadership style was calculated by first averaging the leader-member exchange scores of tellers within a particular branch and by then assigning each teller within that branch that average value. Within-unit differences in leadership style were calculated by subtracting an individual's leader-member exchange score from the unit's average value. The first analysis consisted of correlating average, deviation, and original (or total) leader-member exchange values with individual turnover; a second analysis consisted of making separate hit-rate analyses for predicting turnover from both averaged and total leader-member exchange values, following median splits on the predictor dimensions. The median splits resulted in differential predictions for some individuals; for instance, individuals might be above the median on the dimension of total leader-member exchange, but assigning a group-average to them would place them below the median for the subsequent analysis. Following Graen et al., the measures of teller affect were correlated with turnover while partialing out total leader-member exchange, and total leader-member exchange was correlated with turnover while partialing out employee affect.

RESULTS

Table 1 exhibits the correlations between components of leader-member exchange and turnover for the present sample, and also shows the correlations Graen et al. (1982) reported (in parentheses) for purposes of comparison. Perhaps one of the more striking features of these results is the similarity in correlations across studies among total leader-member exchange, average leadership style, and deviation leader-member exchanges. Also quite striking is the general lack of strong support within the present sample for leader-member exchange, in any of its component forms, as a predictor of turnover. Although the difference in correlations of turnover with average leadership style (.20) and deviation leader-member exchange (-.09) is greater in the

¹A principal components factor analysis for the leader-member exchange scale yielded one factor, accounting for 80.2 percent of the variance. The obtained differences among the associated item loadings (.541, .567, .040, .717) resulted in the dropping of the third item of the scale before summing the remaining items and performing the statistical tests.

TABLE 1
Correlations Among Components of Leader-Member
Exchange, Turnovers and Affect

	Means	s.d.	Possible Range	Components of Leader-Member Exchange				
				Total	Average	Deviation	Turnover	JDI BR
Total leader-member exchange	9.58	1.78	3-12					
Average leadership style	9.58	.093	—	.52* (.48*) ^a				
Deviation leader-member exchange	0.00	1.51	—	.85* (.89*)	.00 (.02)			
Turnover ^b	0.31	0.47	0-1	.02 (-.44*)	.20 (-.22)	-.09 (-.38*)		
JDI supervision subscale	42.80	9.93	0-54	.43*	.47*	.21	.13	
Brayfield-Rothe (BR) scale	63.16	8.32	18-90	.25	.17	.19	.04	.34*
Faces scale	8.89	1.69	1-11	.32*	.32*	.18	.11	.33* .65*

^aCorrelations reported by Graen et al. (1982) are in parentheses.

^bDummy coded with 1 = turnover, 0 = no turnover.

* $p < .05$.



present study, the presently obtained positive (albeit insignificant) correlation between turnover and average leadership style suggests the surprising idea that higher levels of unit exchange are associated with greater turnover.

Two hit rate analyses were conducted with individual leader-member exchange and average leadership style as predictors of turnover, predicting individual tellers as stayers or leavers on the basis of median splits on each dimension. Cross-tabulation of these predictions with observed employment status generated the cell entries for the two analyses reported in Table 2. The resulting associations support neither individual leader-member exchange nor average leadership style as a powerful predictor of turnover. These results differ from the supportive hit-rate evidence of 73 percent Graen et al. (1982) reported for total leader-member exchange.

Table 3 shows correlations between total leader-member exchange and turnover, correlations between total leader-member exchange and turnover after partialing out employee affect, and also the converse correlations, that is, those between employee affect and turnover, and between employee affect and turnover after partialing out total leader-member exchange. Generally, total leader-member exchange and employee affect did not significantly predict turnover. Also, the partialing procedure did not enhance the correlations. By comparison, Graen et al. (1982) reported that the correlation of leader-member exchange with turnover remained fairly substantial after partialing various measures of affect (e.g., the JDI subscales and overall job satisfaction). However, the present results also failed to identify satisfaction as a powerful predictor of turnover.

TABLE 2
Turnover Frequency and Hit-Rate
for Group-Averaged Leadership Style
and Total Leader-Member Exchange

Predictor	Prediction				Hit Rate % ^c	χ^2 ^d
	Leave		Stay			
	Hit ^a	Miss ^b	Hit ^a	Miss ^b		
Average leadership style	5 (12) ^e	18 (13)	13 (15)	9 (8)	40 (56)	1.93 (0.86)
Total leader-member exchange	6 (16) ^d	15 (9)	16 (19)	8 (4)	49 (73)	0.12 (10.70*)

^aDenotes correct prediction

^bDenotes erroneous prediction

^cBase rate for current study = 68.8%; base rate reported by Graen et al. (1982) = 58.3%.

^dWith 1 df

^eValues reported by Graen et al. (1982) are in parentheses.

*p < .01

TABLE 3
First-Order Partial Correlations with Turnover
as the Dependent Variable

Predictor	Controlling for:	Partial correlation
Leader-member exchange	JDI supervision subscale	-.00(-.33*) ^a
Leader-member exchange	Brayfield-Rothe scale	.04
Leader-member exchange	Faces scale	.03
JDI supervision subscale	Leader-member exchange	.14(-.07)
Brayfield-Rothe scale	Leader-member exchange	.12
Faces scale	Leader-member exchange	.09

^aCorresponding correlations that Graen et al. (1982) reported are in parentheses; Graen et al. (1982) did not study the Brayfield-Rothe and the Faces scales.

* $p < .01$

DISCUSSION

None of the component forms of leader-member exchange correlated significantly with turnover in the present sample. Also, observed hit rates for predicting turnover did not exceed base rate expectations. Had the present study successfully replicated the earlier findings of Graen et al. (1982), an argument could easily be made for the extension of their conclusions across populations, but, because the present results did not support the hypothesized relationships as strongly as did the earlier results, possible spuriousness of the earlier results, as well as the likely influences of sample-specific confounding must be considered. In essence, the present failure to replicate argues for limited generalizability of the conclusions previously reached regarding the utility of the leader-member exchange approach for predicting employee turnover.

A more positive and cautious conclusion would be that the leader-member exchange approach has potentially greater predictive utility for turnover among high-level employees than among low-level employees. To date, support for the leader-member exchange approach has largely, although not exclusively (Vecchio & Gobdel, 1984), been obtained with samples of high-level employees. The opportunity for qualitative differences in the nature of relationships between subordinates and superiors, as well as the importance that is attached to differences in the quality of relationships, may be greater in high-level occupations than in low-level ones.

Nonsupportive results, when viewed without rigid preconceptions, can be as informative as supportive results. As Greenwald (1975) noted, the predisposition to discount nonsupportive findings may be detrimental to the advancement of science, if there is no inherent or a priori reason to believe that a given nonsupportive finding is invalid. When conflicting results emerge from independent assessments of the same phenomena and statistical artifacts are not readily evident, investigators must make theoretical efforts to

identify possible underlying determinants of the divergent results. Further research must determine whether (1) attributes of the jobs that were studied, or (2) demographic or attitudinal differences in the job incumbents were independently or jointly responsible for the present failure to replicate precisely the findings of Graen et al. To be sure, the leader-member exchange approach continues to offer intriguing insights and an innovative approach to the study of leadership-related phenomena.

There are several special circumstances that may also be partially responsible for null results when conducting research on turnover. Turnover may be due to employees being attracted away, rather than driven away, from a work unit. The attraction hypothesis states that the attraction of another firm is greater than the attraction of the current employer. In the present study, the positive, but weak correlations between satisfaction measures and turnover are compatible with an attraction hypothesis. Differences in turnover rates across work units (in the present study, branches) can also contribute to null findings. Moreover, mail surveys may not offer the best approach for assessing leader-member exchange.

Future research must devote effort to developing conceptual linkages for relating leadership to employee turnover; at present, the leader-member exchange approach exemplifies a fairly simple and straightforward approach to relating these domains. The specific processes that may underlie any relationships are presently unclear. In short, the questions of "how" and "when" (in addition to the present question of "where") leadership phenomena influence individual turnover remain to be explored. Until these questions are addressed, studies that attempt to relate leadership to employee turnover are likely to continue to yield mixed results.

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EFFECTS OF GENDER ON ARBITRATORS' DECISIONS

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Since the passage of the Labor-Management Relations Act in 1947, public policy in the United States has encouraged the adoption of binding arbitration as a method for resolving disputes involving interpretation of contracts. Both labor and management have strongly endorsed arbitration as the final step in the grievance process, and recent surveys show that 94 percent of private sector collective bargaining agreements establish arbitration as the final step in the grievance procedure (Allen & Keaveny, 1983). Briggs and Anderson (1980) estimated that between thirty and fifty thousand arbitration cases are heard annually in the United States.

Historically, most arbitration research has focused on differences in demographics and values among arbitrators and on the impact of these differences upon arbitrators' decisions (Cain & Stahl, 1983; Heneman & Sandver, 1983; Nelson & Curry, 1981). During the past decade, however, attention has increasingly been devoted to examining the role of arbitrators in grievances concerning discrimination (Murphy, 1981). This interest is not particularly surprising given the abundance of research during the past decade that has documented the existence of discrimination against women across a broad array of employment related decisions.

Rosen and Jerdee (1974), for example, found that administrators who were men tended to discriminate against women employees in personnel decisions involving promotion, development, and supervision. Dipboye, Fromkin, and Wiback (1975) reported discrimination toward women in selection decisions. Research in the area of performance appraisal and disciplinary actions offers conflicting findings regarding the possible effects of grievant's gender upon arbitrators' decisions. Larwood, Rand, and DerHovanesian (1979) found punishing personnel actions to be more readily recommended against a woman than a man when each was employed in a traditional work role. On the other hand, Pence, Pendleton, Dobbins, and Sgro (1982), in the context of a performance evaluation simulation, found that subjects considered it more appropriate to punish men employees than women employees. Not all studies have found discrimination against women. Bigoness (1976), for example, found that although low-performing men and low-performing women were rated nearly identically, high-performing women were rated significantly higher than high-performing men.

To date, little research has sought to explore the effects of grievant's gender upon arbitrators' decisions. Based upon a limited but unspecified number of cases and on his own experience as a labor arbitrator, Rosenberg (1979) asserted that arbitrators discriminate against women grievants. Using an in-basket grievance case simulation, Rosen and Jerdee (1975) found that when the appellant was a man, a polite, pleading appeal was very favorably received and an aggressive, threatening appeal was fairly well received, but when the appellant was a woman, an aggressive, threatening appeal was quite favorably received and a polite, pleading appeal was much less well received. However, in a field study, Dalton and Todor (1983) found that grievants who were women were half again more likely to receive favorable grievance outcomes than grievants who were men. These results were found to be consistent regardless of the nature, severity, or viability of the grievance filed.

The preceding discussion leads to our first hypothesis:

Hypothesis 1: Arbitrators will treat grievants who are women less severely than grievants who are men, and will regard women's offenses as less serious than they would regard the same offenses if men committed them.

Most of the studies reviewed in the preceding paragraphs consisted of situations in which men were requested to evaluate women. Far fewer stud-

ies have sought to investigate whether or not men and women make comparable employment related decisions. Our review of the arbitration literature failed to identify any study of the possible effects of arbitrators' gender upon their decisions. A possible explanation for the dearth of research on this topic is the paucity of women arbitrators. In two contexts, a selection decision (Rose & Andiappan, 1978) and a performance appraisal session (Muchinsky & Harris, 1977), investigators found women raters to be more lenient than men. Thus, our second hypothesis is:

Hypothesis 2: Women arbitrators will render less severe judgments than men arbitrators and evaluate grievances as less serious in nature than will men arbitrators.

The extent to which alternative combinations of grievant-arbitrator gender might affect arbitrators' recommendations remains unclear. Mai-Dalton and Sullivan (1981) reported that men more frequently selected other men for a challenging task and women in the study preferred to select other women. In a study of willingness to counsel employees, Pence and his colleagues (1982) reported a significant interaction effect between gender of the counselor and gender of the employee: in general, subjects considered it more appropriate to work with and encourage employees of their own gender. However, Mobley (1982) found that various manager-subordinate gender combinations had no effect on performance ratings. Our third hypothesis is:

Hypothesis 3: Arbitrator's gender and grievant's gender will interact such that women arbitrators will treat women grievants more favorably than will men arbitrators and men arbitrators will treat men grievants more favorably than will women arbitrators.

METHODS

Subjects

Subjects were 80 undergraduate students enrolled in personnel administration and labor-management relations courses at the University of North Carolina at Chapel Hill.

Procedures

We presented experimental materials as an in-class arbitration exercise, asking subjects to assume the role of an arbitrator and render several decisions in a case involving an alleged violation of a work rule. The arbitration case, selected from *Labor Arbitration Reports* (Bureau of National Affairs, 1971) and slightly modified for this study, involved the discharge of an employee for allegedly drinking an alcoholic beverage at his work station. The case included background information pertaining to the incident, the company's position, and the union's position. For the study, we created two versions of the case, one identifying the grievant as a man, Philip D. Blendon, and the other identifying the grievant as a woman, Mary D. Blendon. The grievant's name and the appropriate pronoun (he or she) were prominently

noted throughout the text. Aside from this difference, the arbitration cases presented were identical.

We distributed the cases randomly to men and women students; individuals received only one version each and so remained unaware of the manipulation. Gender of the arbitrator (subject) and gender of the grievant were the independent variables of interest, resulting in a 2×2 factorial design. Cell sizes for each experimental condition were as follows: man arbitrator/man grievant ($n = 23$); man arbitrator/woman grievant ($n = 19$); woman arbitrator/man grievant ($n = 18$); and woman arbitrator/woman grievant ($n = 20$).

Dependent Variables

The study employed two dependent variables. The first was severity of punishment, scaled as follows: (1) oral warning with no written record; (2) written reprimand included in employee's personnel file; (3) three-day suspension without pay; (4) two-week suspension without pay; and (5) discharge. The second dependent variable, assessment of the seriousness of the grievant's offense, was measured on a five-point scale ranging from not particularly serious to extremely serious.

RESULTS

Table 1 shows the study's results. The average severity of punishment was 3.38, which falls between two choices, the three-day and the two-week suspension. The average rating for seriousness of the offense was 4.25, slightly above the moderately serious point on the scale.

Our first hypothesis predicted that subjects would treat women grievants less harshly than men grievants and regard their offenses as less serious. Results failed to support this hypothesis. Grievant's gender significantly affected neither the mock arbitrators' rulings ($F_{1,76} = .02$, $p = \text{n.s.}$) nor their perceptions of the seriousness of the offense ($F_{1,76} = 1.39$, $p = \text{n.s.}$).

Our second hypothesis proposed that women arbitrators would render less severe judgments and regard the grievant's offense as less serious than men arbitrators would. This hypothesis was partially supported. Although men and women subjects did not significantly differ in their arbitration decisions (3.50 vs. 3.24, $F_{1,76} = 1.14$, $p = \text{n.s.}$), women arbitrators viewed the grievant's offense as marginally less serious than did male arbitrators (4.11 vs. 4.38, $F_{1,76} = 3.44$, $p < .06$, $\omega^2 = .04$).

Our final hypothesis postulated that arbitrators of the same gender as grievants would treat these grievants more favorably and regard their offenses as less serious than would arbitrators of the other gender. Results failed to support this hypothesis. Neither the mock arbitrators' rulings ($F_{1,76} = .30$, $p = \text{n.s.}$) nor their perceptions of the seriousness of the offense ($F_{1,76} = 1.58$, $p = \text{n.s.}$) were significantly affected by the arbitrator/grievant gender combination.

TABLE 1
Arbitrators' Decisions by Arbitrator's
Gender and Grievant's Gender

Arbitrator's Gender	Grievant's Gender	
	Men	Women
Arbitrator's ruling		
Men		
Mean	3.35	3.68
Standard deviation	.93	1.16
n	23	19
Women		
Mean	3.39	3.10
Standard deviation	1.14	1.31
n	18	20
Seriousness of offense		
Men		
Mean	4.26	4.53
Standard deviation	.75	.51
n	23	19
Women		
Mean	4.06	4.15
Standard deviation	.94	.49
n	18	20

DISCUSSION

Although researchers have recently devoted attention to the issues raised by sex discrimination grievances, we identified no studies that investigated the effects of gender upon arbitrators' decisions. Drawing upon earlier research documenting sex discrimination, the present study hypothesized that women grievants would be less harshly treated than men grievants and that an offense committed by a woman would be regarded as less serious than the same offense committed by a man. Contrary to our prediction, mock arbitrators treated men and women grievants comparably. However, women regarded the grievant's offense as less serious than men did. Finally, different arbitrator-grievant gender combinations did not affect arbitrators' decisions or their assessments of the seriousness of the grievant's offense.

For now, it appears that research does not support concerns about possible gender bias influencing arbitrators' decision. However, in the present study subjects in all treatment conditions viewed the alleged offense, drinking on the job, as a serious offense warranting stern punishment. Perhaps using this grievance restricted the range of responses and thereby weakened the possible effects of the independent variables.

Future research should seek to ascertain the external validity of this study's findings by comparing our results with results based on decisions of

actual men and women arbitrators. The fashion in which arbitrators get their information should also be studied; our mock arbitrators based their decisions on written transcripts, but most practicing arbitrators base decisions heavily upon oral testimony. Cases involving other types of grievances might also be studied. In addition, future studies should examine the possible effects of (1) sex role stereotypes, (2) sex typing of jobs, and (3) sex typing of grievants' excuses upon arbitrators' decisions. Finally, future research should seek to determine whether women are in fact more lenient evaluators than men, and, if so, what factors explain this greater leniency.

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THE EFFECTS OF COMPARISON OTHERS AND PRIOR EXPERIENCE ON RESPONSES TO TASK DESIGN

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Recent research on task design has focused on the study of factors outside jobs themselves, examining, for instance, uses of variables based on individual differences such as growth needs (Ganster, 1980; Griffin, 1981; Hackman & Oldham, 1975; Lawler, Hackman, & Kaufman, 1973; Stone, Mowday, & Porter, 1977). A number of reviewers and researchers have suggested that factors in work environments, other than individual characteristics, such as work groups, supervisory behavior, and the like, may influence the response of workers to job enrichment (Griffin, 1981; Katzell & Yankelovich, 1975; Pierce & Dunham, 1977). Dunham (1977) found that divisional affiliation in an organization affected responses to job enrichment. Oldham, Hackman, and Pierce (1976) found that satisfaction with various contextual aspects of a job, such as pay, security, and supervisors, had an influence on responses to enriching task characteristics. In other studies, in which direct social cues have been used to influence reactions to task characteristics (O'Reilly & Caldwell, 1979; Weiss & Shaw, 1979; White & Mitchell, 1979), the general findings have been that these social cues do, in fact, influence responses to task design.

The last three studies cited used direct personal encounters to influence reactions to the scope of tasks. In actual work settings, individuals may use their knowledge of other tasks done in their organization to form perceptions and responses to their own tasks.

Equity theory (Adams, 1963) can be used to model a situation in which individuals perceive and respond to tasks on the basis of knowledge of other organizational tasks. Specifically, if enriching task characteristics are viewed as outcomes using the equity framework, some predictions can be offered that might explain effects associated with task design in complex social settings. Two issues require elaboration: First, the assumption that workers see increased task scope as a positive outcome has received some support and was the basis for some of the original theorizing by Herzberg, Mausner, and Snyderman (1959) as well as the conclusion drawn by a number of reviewers of the job enrichment literature (Katzell & Yankelovich, 1975; Pierce & Dunham, 1977). Although, as Roberts and Glick (1981) suggest, common method variance may have inflated the correlation between task characteristics and satisfaction, it can be concluded that, in general, workers see the presence of enriching task characteristics as positive.

The second issue is the nature of the social comparison being made. If individuals are aware of others working on jobs of different scope from their own task, equity theory would suggest that those individuals might feel that this situation is inequitable and that they would act in some fashion to relieve tension associated with that inequity. It can be argued that one type of perceived inequity, over-reward, might be created by allowing a person to work on a task and by then providing that person with information about other individuals who receive equal extrinsic rewards yet work on a less enriched task. One of the responses suggested by Adams (1963) to this type of inequity is that individuals will increase inputs to bring their input-outcome ratio back into balance. Although evidence that individuals will actually increase inputs in situations of perceived over-reward is mixed (see Mowday, 1979), the prediction that they will increase inputs is consistent with equity theory and has not been explored using nonmonetary outcomes as the source of inequity.

Hypothesis 1: Individuals working on a relatively enriched task who know of a group working on a similar but less enriched task will perform at a higher level than individuals working on the same task who are unaware of a comparison group.

Equity theory also proposes that individuals may make equity comparisons based on their own prior experience rather than some salient other in the environment. This rationale leads to the prediction, similar to Hypothesis 1, that internal comparisons based on prior experience will lead to feelings of over-reward and thus lead to increases in both inputs and performance.

Hypothesis 2: Individuals working on a relatively enriched task who have had prior experience with a similar but less enriched task will perform at higher levels than

individuals working on the same task who have not have had such prior experience.

It is interesting to consider what effect comparison information on task scope might have on individuals' satisfaction, though it is not clear what that effect might be. On one hand, increased task scope, in general, should be satisfying. However, it might also be predicted that the guilt associated with a sense of being over-rewarded might lead to lower satisfaction. Related to this is the issue of whether changes in inputs (i.e., increased performance) would reduce the sense of inequity and therefore not affect satisfaction measured later. In light of this potential conflict, no specific hypothesis was made as to the effect of comparison information on task scope, but data were gathered to explore the issue further.

METHODS

Subjects

Ninety-eight men and 70 women participated in this laboratory experiment. Subjects were randomly assigned to four cells in a 2×2 factorial design. Subjects were obtained from the subject pool of an introductory psychology class and from three sections of a personnel administration class; the latter were offered extra credit for participating in this experiment. As these two subject groups were not aware of each other, there would not have been any feelings of inequity generated by the differing external reward systems.

Procedures and Experimental Task

Subjects in this experiment, who performed in groups varying in size from 2 to 14 members, worked in a large room and generally worked two at a table.

The experiment was introduced as an effort to improve the inventory and purchasing functions at the university; subjects were told that the task on which they would work simulated the ordering procedure used by various departments within the university. All materials were replicas of university documents and forms, and the task involved looking up items being requisitioned on a large computer printout of approximately 2,000 items.

Once they had located an item, subjects had to calculate new balances and make decisions about reordering stock and also had to send out-of-stock reports to requesting departments. This was the broad-scope task.

In the narrow-scope task, subjects performed only a small portion of the broad-scope task. Both versions of the task were developed in an earlier study of job enrichment (Pritchard, Montagno, & Moore, 1977). In this previous study, when the two levels of enrichment described were measured using the Job Diagnostic Survey (Hackman & Oldham, 1975), they had significantly different motivating potential scores (MPS).

In the present study, two experimental conditions were established: prior experience and comparison-with-others. The purpose of the prior-experience manipulation was to give subjects experience on a narrow-scope

task before they worked on the broad-scope task. The comparison-with-others manipulation attempted to convince subjects working on the broad-scope task that there was another group of subjects working on a narrow-scope task.

After an introduction, subjects in the prior-experience condition were trained on a single task and given an opportunity to work on it for 10 minutes. Training for this task took only 3 or 4 minutes, since copying numbers was all that was involved.

Training for all subjects on the broad-scope task took place either after the prior experience session or after the introduction. This training took approximately one-half hour. Training materials were all marked "sample," and the experimenter verified that all subjects understood the task before the actual work session was begun.

After subjects in the comparison-with-others condition were trained to perform the broad-scope or enriched task, the idea of task simplification was introduced in that they were told that some of them would work on only a small portion of the task; the group was then randomly divided into two subgroups. After the groups were settled, each was told that it was the group that was going to work on the entire task. In effect, then, each subgroup thought the other was working on the unenriched task.

These manipulations resulted in four conditions:

1. No comparison group — no prior experience ($n = 41$),
2. No comparison group — prior experience ($n = 48$),
3. Comparison group — no prior experience ($n = 38$),
4. Comparison group — prior experience ($n = 41$).

Measures

Performance. Quantity of performance was defined as the total number of items processed in the work session. Quality was defined as the error rate for each subject, that is, the total number of clerical errors committed divided by the total number of items processed.

Satisfaction. Satisfaction was measured using a 10-item graphic rating scale which asked subjects how enjoyable, satisfying, and so forth, they found the task. In a pilot study, this scale significantly discriminated between the satisfaction of subjects working on a boring task and subjects working on an interesting task ($t = 3.06$, $df = 36$, $.09$, $p < .01$; $\alpha = .88$).

Task characteristics. A measure of perceived task characteristics was derived by summing the scores of the 5 subscales of the Job Diagnostic Survey (JDS). The reliabilities of the subscales were as follows: skill variety, .71; task identity, .51; task significance, .66; autonomy, .66; and feedback from the job, .71.

Request for pay. Subjects were asked to indicate how much they thought they should be paid to perform a real job similar to this task. It was reasoned that individuals requesting higher pay would be those who, feeling that the

task provided few intrinsic outcomes, would ask for more extrinsic outcomes as compensation than would those who felt the job provided adequate intrinsic outcomes. Research on job design and labor wage settlements suggests that individuals who have jobs that require more responsibility or skills generally expect higher pay (Fein, 1973). In the situations investigated in such research, individuals generally have knowledge that allows them to compare their pay levels as well as their task characteristics with those of others. In this study, subjects, who had no external knowledge of others' pay, presumably responded to the perceived equity of the tasks.

RESULTS

Manipulation Check

In order to check the manipulation for the comparison-with-others group, the task characteristics section of the JDS was administered to subjects in this experimental condition immediately after the division into subgroups. Subjects were told to describe the job that the other group was performing — the group they believed to be working on the narrow-scope task. At the end of the work session, they described their own task.

The results of the paired *t*-test that examined differences in task scope showed that subjects who thought there was a comparison group perceived their own task to have more scope than the comparison group's presumed task ($t = 4.50$, $df = 83$, $p < .001$).

No specific check was made for the prior experience manipulation. It was not considered necessary, since the data from Pritchard, Montagno, and Moore (1977) indicated that people who perform a narrow-scope version of this task and then perform the broad-scope task do perceive differences between the two.

Comparison Group Effects

The first hypothesis was concerned with the effect of providing subjects with a group to which they could compare themselves who were performing a similar but less enriched task than subjects perceived themselves as performing. Table 1 shows the results of the 2×2 analysis of variance that examined the effects of the experimental manipulation on the number of purchase requisitions that subjects processed, the measure of quantity. This table demonstrates that the comparison-group manipulation had a significant effect on the quantity of performance ($F = 4.34$, $p < .05$). The table also shows that the effect was in the predicted direction: persons who thought there was another group of subjects working on a less enriched task than their own performed faster than those who were unaware of another group.

Table 1 also contains the results of the analysis in which errors were treated as dependent variables. It can be seen that the comparison group manipulation had a significant effect on errors ($F = 9.91$, $p < .01$) that was also in the predicted direction: those who knew of the comparison group committed fewer errors.

TABLE 1
Means and Standard Deviations for Each Condition
and Results of Main Effect Comparisons

Equity Condition	Level		F
	No	Yes	
Comparison others			
Quantity ^a	28.96 (10.75) ^c	32.16 (9.58)	4.34*
Errors per requisition ^a	3.33 (2.33)	2.60 (2.14)	9.91**
Satisfaction ^b	26.73 (11.04)	25.64 (12.79)	.33
Prior Experience			
Quantity ^a	29.45 (8.45)	32.01 (11.86)	2.84
Errors per requisition ^a	2.94 (2.22)	2.94 (2.31)	.00
Satisfaction ^b	28.06 (12.32)	23.95 (10.98)	7.68**

^adf = 1,164

^bdf = 1,160

^cStandard deviations are in parentheses

*p < .05

**p < .01

The analysis of satisfaction in Table 1 shows that the comparison group manipulation had no effect on satisfaction.

Prior Experience Effects

The hypothesis concerning prior experience proposed that providing subjects with prior experience on a less enriched task would create a feeling that they were being over-rewarded when working on the more enriched task. Table 1 shows that the prior-experience manipulation produced results as to quantity that were in the predicted direction, but the effect was not strong enough to reach conventional levels of significance. As Table 1 also shows, prior experience had no effect on the error rate. Prior experience did, however, have a significant effect on satisfaction ($F = 7.86$, $p < .01$): those subjects who had prior experience were less satisfied than those who had none.

Although no specific interaction hypothesis was proposed, an analysis of the interactive effect between prior experience and comparison-with-others was made; the interaction was not significant ($F = .691$, $p > .05$).

Request for Pay

The underlying assumption of this research was that the manipulations involving the comparison group and prior experience would actually create

a feeling that they were being over-rewarded in subjects that would alter performance. The performance and satisfaction measures, which reflect only presumed outcomes of inequitable feelings, are not themselves direct measures of equity. In an attempt to get a better index of the effect of the experimental manipulations on subjects' feelings about equity, an analysis was run on subjects' request for pay.

This analysis of subjects' requests for pay shows that the comparison group manipulation had the predicted effect. Subjects in the no-comparison condition asked for \$3.95 per hour, but those who knew of the comparison group asked for \$3.29 per hour ($F = 4.69, p < .05$). This result supports an equity interpretation of the effects of a comparison group. The fact that subjects who knew of the comparison group actually requested lower extrinsic outcomes than did those who did not know of such a group implies that the former may have perceived other intrinsic outcomes in the situation.

DISCUSSION

Considering the effects of the experimental manipulation suggests that those effects associated with the comparison group are stronger and more interpretable than those associated with the prior experience manipulation. The comparison group manipulation influenced both performance and request for pay, but the prior experience manipulation influenced only satisfaction. From the viewpoint of equity theory, the effects of the comparison group seem quite consistent. That is, subjects were made to feel over-rewarded and responded by both increasing their inputs and requesting lower outcomes — less pay — than did those who had no comparison group.

This finding is interesting for two reasons: First, it demonstrates that the social context in which people work may affect their responses to intervention, such as changes in the scope of their jobs. This further suggests that systematic effects measured in job enrichment studies may be attributable to unanticipated extraneous factors, a result consistent with other findings (O'Reilly & Caldwell, 1979; Weiss & Shaw, 1979; White & Mitchell, 1979).

The second implication of this finding concerns equity theory. The typical equity experiment in the organizational behavior literature has been concerned with the role of money in creating inequity. In this study, a feeling of being over-rewarded was developed on the basis of task characteristics. This finding supports and extends the results of the study done by Oldham, Nottenburg, Kaesner, Ferris, Fedor, and Masters (1982).

These results have, of course, certain limitations: Generalization of the findings is limited because of the short-term nature of this study, for there is no way to determine from a laboratory study whether the effects found would be dissipated over time. Considering this, it seems reasonable to conclude that the understanding of the effects of job scope must now be expanded to include possible effects of social context on individual responses.

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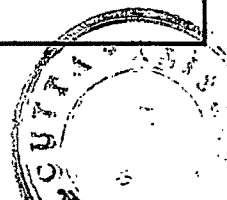
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